The Journal
OF THE KANSAS MEDICAL SOCIETY

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MAY, 1953 VOL. LIV, NO. 5

STORMONT MEDICAL LIBRARY
TOPEKA, KANSAS MAY 20 1953

Parke, Davis & Company announces a new series

THEME: "In the hands of you

TIME

Ever see a "telegram" from your heart?

You are looking at an electrocardiogram . . . a record of the tiny electrical impulses given off at each beat of your heart.

When interpreted by your doctor, such "telegrams" may read, "Patient's heart normal . . . no worry." Others may say "Patient's heart faulty . . . help required."

Yet, even when the heart sends out a message of trouble, it does not necessarily mean impending surgery. For even a defective heart is capable of working for years if not overburdened.

Thousands of people are living good lives with bad hearts . . . because they acted wisely and in time.

First, they did not ignore the warning that often precedes heart trouble—shortness of breath, pains in the chest, irregular beating of the heart, and so on. Instead, they heeded these warnings in the clear, irrefutable language of the electrocardiogram. Having learned their true meaning, they consulted an understanding doctor who helped which method would be best for them.

Second, they accepted the limitations and restrictions imposed by a weakened heart. They tried not to "over-do", they learned to avoid sudden exertion, and to keep weight at the normal level. They also recognized the value of sleep and relaxation, and the importance of keeping their lives free from worry and strain.

Remember this: If your physician's hands, you are in good hands. For today physicians are better equipped than ever before to treat and control heart disease—and to guard against it as well. By taking advantage of the help your doctor can give you, you increase your chances of living a good life with a bad heart.

PARKE, DAVIS & CO.

SATURDAY EVENING POST

This man is his own worst enemy! Yet most of us can sympathize with him—for many of us don't "run to the doctor" every time we have an ache or pain.

We're much more likely to say "Oh, I'm not sick. It's only nothing." Or to tell ourselves, "I'm no baby . . . haven't time to bother with doctors."

Yet, the men (or women) who ignore seemingly minor symptoms often run the risk of serious illness. That's because most chronic ailments, or neglect, the more they are due to is ignore warning symptoms until it may be too late for the doctor to help.

Medical research in America today is making one of the most heart-warming chapters in the story of mankind. Our great clinics, our hospitals, universities, and laboratories, our industrial organizations, and a host of governmental and private bodies are constantly improving on every failure to improve our chances of living a longer, healthier life.

Your own doctor has at his disposal all of the discoveries, all of the knowledge, of modern medical science. But you are the only one who can put those vast resources to work to help him.

So next time you are tempted to ignore warning symptoms, remember that your greatest danger lies in neglect and delay. Remember—to your physician's hands, you're in good hands. But only by acting promptly can you take advantage of the help he can give you now.

This message is published in the public interest by Parke, Davis & Company.

Since 1866, physicians have prescribed and pharmacists have dispensed medicines bearing the Parke-Davis label.

PARKE, DAVIS & CO.

LIFE

DO YOU KNOW THIS MAN?

HIS NEGLIGENCE IS CAUSING THOUSANDS OF DEATHS FROM HEART DISEASE

RIGHT HAND

LEFT HAND

Here's a description of the culprit:

Overweight. Short of breath. (The old timber really pounds on a flight of stairs.)

Often over-exercises on week-ends after a sedentary week. Sometimes bothered by a peculiar swelling in the ankles.

Works too hard. (Feels he's indispensable in his job.) Has trouble relaxing. Worries. Sleeps poorly. Complains of being "always tired."

Had a couple of attacks of "indigestion" recently. When asked by wife to phone clerk with doctor, was heard to reply: "What for? I'm not sick . . . besides I'm too busy!"

The greatest problem in dealing with heart disease today is the man (or woman) who ignores the "danger signals" until it may be too late to take advantage of the help which medical science today is prepared to give. Yet thousands of people are living good lives with bad hearts . . . because they acted wisely and in time . . . because they knew that with ninety-odd hearts they were in good hands.

That is a fact that needs progress has already been made in dealing with heart ailments, and more and more research is being carried on, largely through such great agencies as the American Heart Association and its nation-wide chapters, the National Heart Institute, and a number of pharmaceutical concerns, including Parke, Davis & Company, about 1400 makers of medicines prescribed by physicians.

PARKE, DAVIS & CO.

...advertisements addressed to the general public...

"Physician, you're in good hands"

Neglect . . . delay. How many times, doctor, have you cared for patients . . . whose hope of recovery might have been bright indeed . . . *but for neglect or delay in seeking your help?*

Undoubtedly, this occurs so often...and usually with such tragic consequences...that many physicians view it as the greatest problem facing medical science today.

Moreover, this problem may assume even greater significance with the rising incidence of the degenerative diseases. For in these conditions, neglect and delay, as you well know, are *directly* responsible for a heavy toll of life.

We believe you will agree that this problem deserves increased and continuing emphasis. This is why Parke-Davis will publish, throughout 1953, a series of advertisements on the *patient's responsibility* in medical care.

These advertisements, four of which are reproduced here, will appear in leading magazines reaching millions of families. In them, this central theme will be emphasized:

That every individual, if he wants his physician's most effective help, must meet the doctor halfway. *He must not ignore symptoms, or delay treatment. He must act promptly . . . and be made to realize that "in the hands of your physician, you're in* good *hands."*

In addition, the advertisements will stress the fact that medicine has a vast store of new knowledge . . . and that this knowledge is constantly increasing through research by physicians, hospitals, public and private health organizations, and pharmaceutical companies.

A word about the preparation of these advertisements: They have been carefully written to avoid both the possibility of stimulating hypochondria and encouraging self-diagnosis. Equally important, the advertisements make no claims that might cause undue optimism or raise false hopes. We believe these are just the type of informative messages you will want your patients to read. Our efforts will be guided and encouraged by your continued interest and comments.

PARKE, DAVIS & CO.

Research and Manufacturing Laboratories, Detroit 32, Michigan

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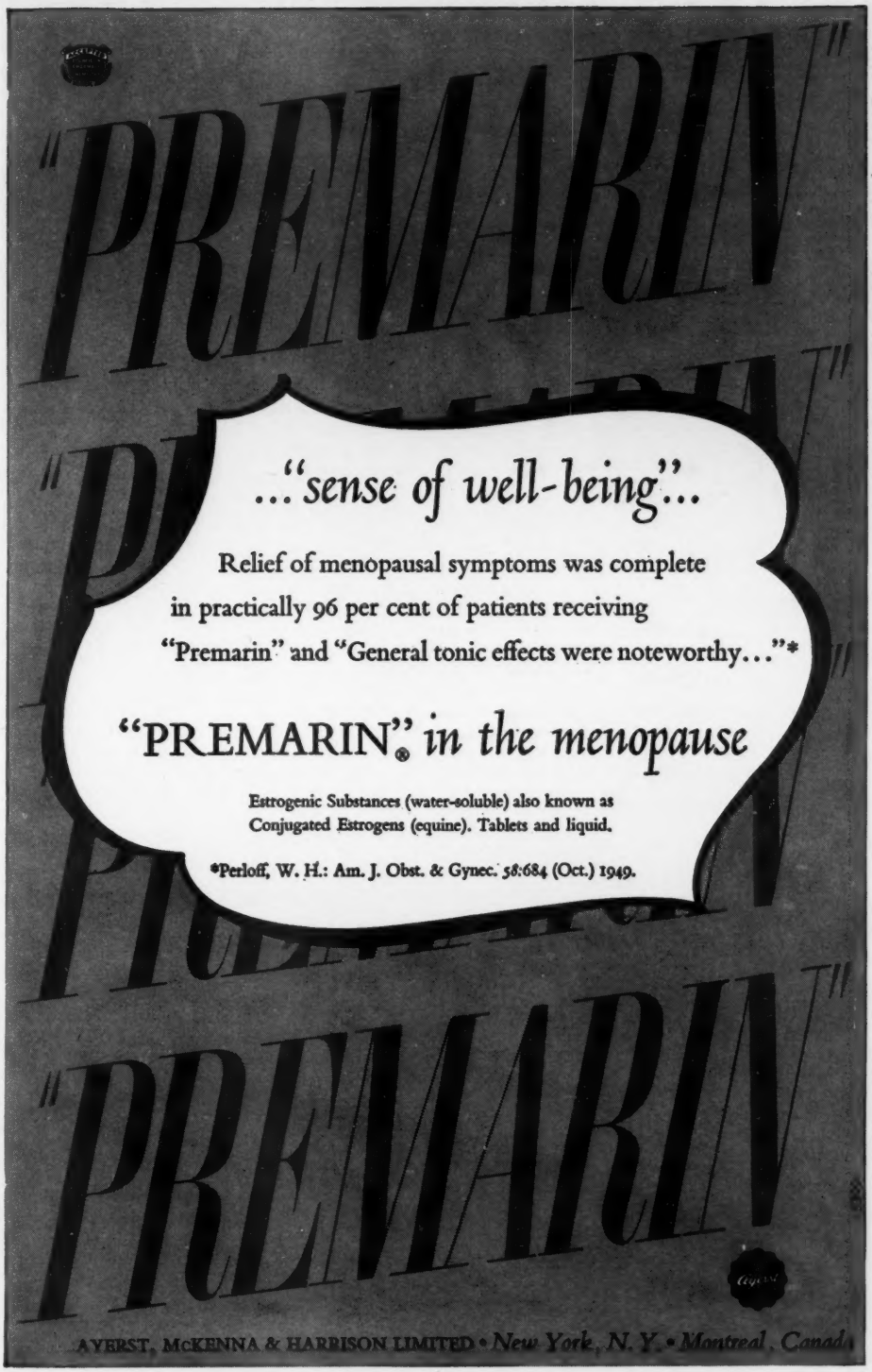
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Relief of menopausal symptoms was complete in practically 96 per cent of patients receiving "Premarin" and "General tonic effects were noteworthy..."*
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*Perloff, W. H.: Am. J. Obst. & Gynec. 58:684 (Oct.) 1949.
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SEDALIA, MO.
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Warrensburg Medical Center

Curbstone Consultation

Free acid was present on repeated analyses in all the 4,000 duodenal and 750 gastric ulcer patients.

Kirsner, J. B. and Palmer, W. L.: Am. J. Med. 13:615, 1952.

Pathologically Speaking

ELECTROLYTE TERMINOLOGY

THE RECENT interest in the study of water and electrolyte problems has introduced new terminology with reference to the electrolytes.

The improved understanding of electrolyte problems has been the result of the use of the flame photometer, isotopes and spectrophotometric colorimetry. The approach to the problems of electrolyte imbalance has been somewhat confusing to some physicians, because of the terminology used in expressing electrolyte values.

The older methods for reporting the value of electrolytes in "milligrams per cent" is not logical or practical. If one considers a balance to exist between the positive and negative ions of the various electrolytes, a true measurable unit must exist.

If one is studying chemical reactions, it is most desirable to have the ions under consideration measured by identical units.

The unit of measurement is known as an "equivalent," and since the amounts are small, the use of milli (1/1000) equivalent is preferred. Electrolytes are reported in milliequivalents; milliosmol, a term used, refers to the relative potential osmotic pressure of electrolyte solution.

The following diagram illustrates the normal value for plasma electrolyte values:

Cations	*MEq/ Liter*	*Anions*	*MEq/ Liter*
Na^+	142	HCO_3^-	27
K^+	5	Cl^-	103
Ca^+	5	HPO_4^-	2
Mg^+	3	SO_4^-	1
		Organic acids	6
		Protein	16
Total	155		155

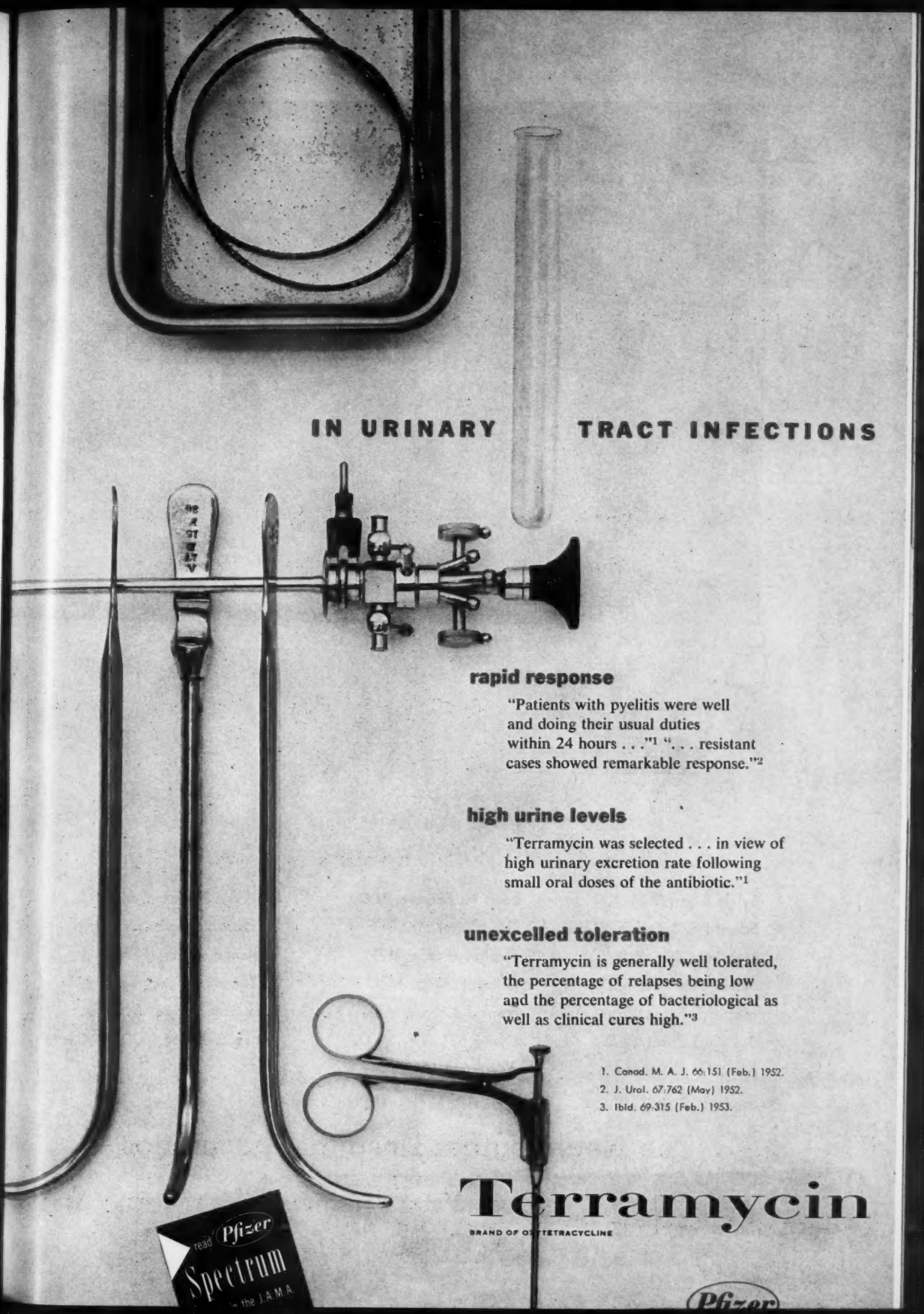
If one is familiar with the data as given above, for plasma electrolytes, the physiologic values are more clearly understood. The variations from the normal pattern are of more significance from the diagnostic aspect, as well as the therapeutic approach.

One may convert electrolytes reported in milligrams per 100 c.c. to milliequivalents per liter, as follows:

Plasma Sodium: 350 mgm./100 ml.
350 × 10 = 3500 mgm./liter
3500 ÷ 23 (Atomic wt.) = 140
Chloride reported as 550 mgm./100 ml.
550 × 10 = 5500 mgm./liter
5500 ÷ 58.5 (Atomic wt. NaCl) = 94.7 mEq./liter

The use of this terminology is essential for one who is keeping abreast of the water and fluid problems as they may exist in patients. The terminology is of distinct advantage in therapy, for most replacement solutions are stated to contain so many milliequivalents of the various electrolytes.

RALPH EMERSON DUNCAN, M. D.
LORAINE E. SCHULTZ, M. D.
ALBERT E. UPSHER, M. D.


IN URINARY TRACT INFECTIONS
rapid response
"Patients with pyelitis were well and doing their usual duties within 24 hours . . ."[1] ". . . resistant cases showed remarkable response."[2]
high urine levels
"Terramycin was selected . . . in view of high urinary excretion rate following small oral doses of the antibiotic."[1]
unexcelled toleration
"Terramycin is generally well tolerated, the percentage of relapses being low and the percentage of bacteriological as well as clinical cures high."[3]
1. Canad. M. A. J. 66:151 (Feb.) 1952.
2. J. Urol. 67:762 (May) 1952.
3. Ibid. 69:315 (Feb.) 1953.
Terramycin
BRAND OF OXYTETRACYCLINE
Pfizer
read Pfizer Spectrum in the J.A.M.A.

Outdoor Recreation Area

In psychiatric therapy recreation is not only "therapy," but play as well. It is important that patients have a chance to get out of their sleeping rooms. The new recreation area at the Neurological Hospital offers almost every patient within a few days after admission, a chance "to get out of the sleeping areas."

Inquiries may be directed to the hospital or to the individual psychiatrist.

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The Neurological Hospital Association

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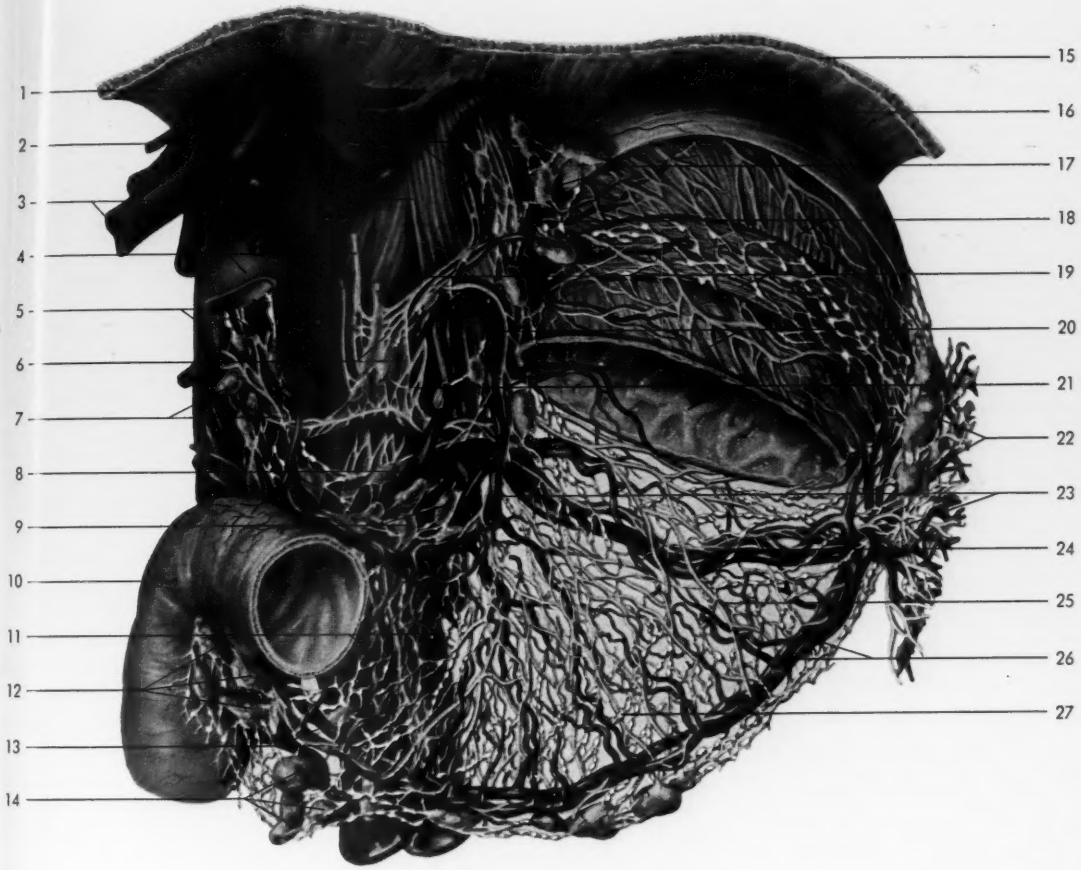
Anatomy *of the* Stomach



1 Middle and left hepatic veins

2 Right vagus nerve and esophagus

3 Right hepatic vein and crura of diaphragm

4 Inferior vena cava and greater splanchnic nerve

5 Portal vein and hepatic artery

6 Celiac plexus and celiac artery

7 Hepatic lymph node and hepatic rami of vagus nerve

8 Gastroduodenal artery and suprapyloric lymph nodes

9 Superior gastric lymph nodes

10 Duodenum

11 Superior mesenteric artery and vein

12 Subpyloric lymph nodes

13 Right gastroepiploic artery and vein

14 Inferior gastric lymph nodes

15 Diaphragm

16 Serosa

17 Paracardial lymph nodes

18 Left vagus nerve and longitudinal muscular layer

19 Abdominal aorta and circular muscular layer

20 Left gastric artery and oblique muscular layer

21 Celiac rami of vagus nerve and gastric mucosa

22 Splenic lymph nodes

23 Left gastric (coronary) vein and splenic rami of vagus nerve

24 Splenic artery and vein

25 Gastric rami of vagus nerve

26 Left gastroepiploic artery and vein

27 Gastric lymphatic plexus

This is one of a series of paintings for Lederle by Paul Peck, illustrating the anatomy of various organs and tissues of the body which are frequently attacked by infection, where aureomycin may prove useful.

Lederle

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in elective surgery of the stomach,

as well as for

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or control infection in all

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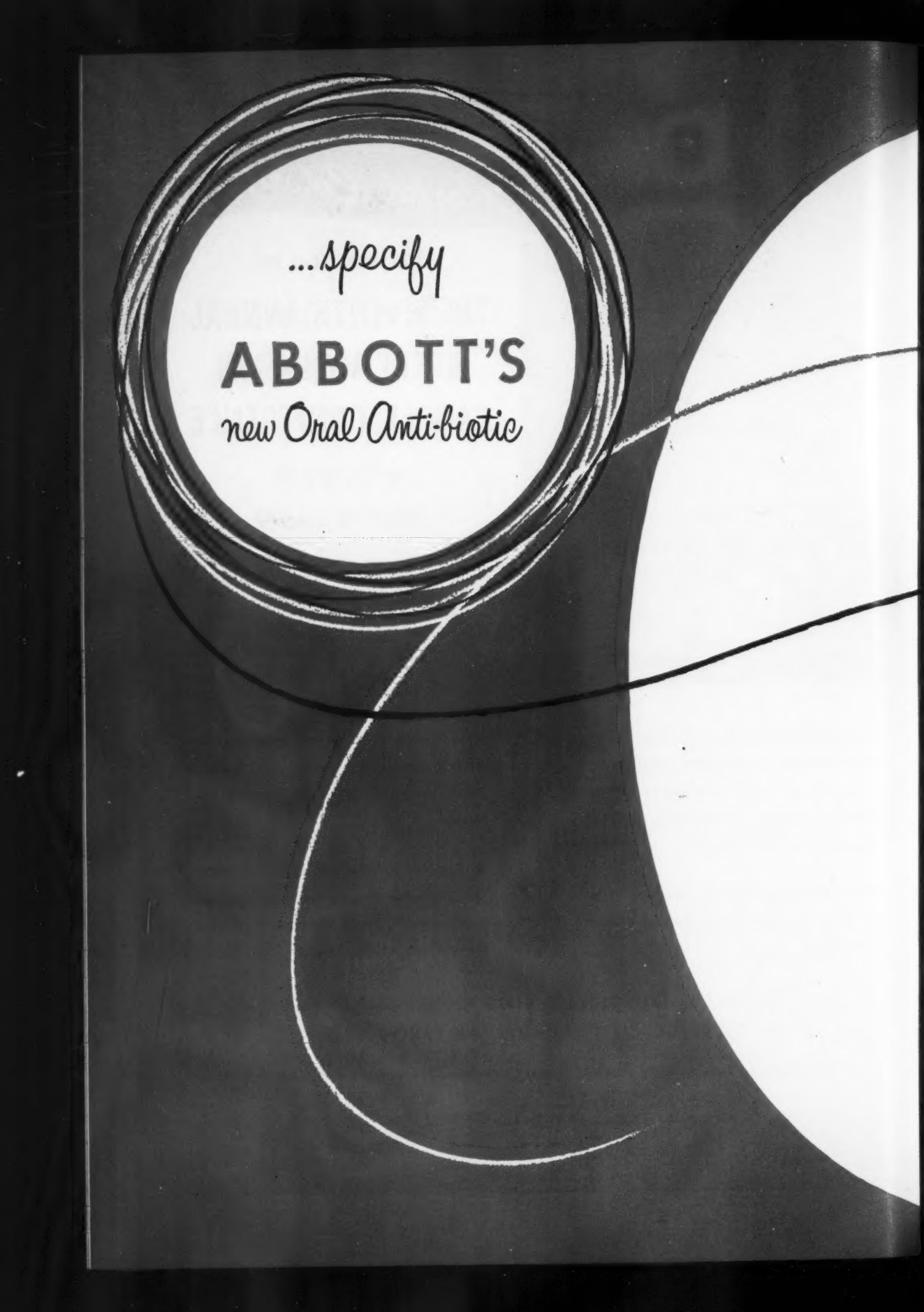
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1. McGuire et al. (1952), J. Antibiotics & Chemo., 2:281, June.
2. Heilman et al. (1952), Proc. Staff Meet. Mayo Clin., 27:385, July 16.
3. Haight and Finland (1952), New Eng. J. Med., 247:227, Aug. 14.

1-139

protein "PICK ME UP" IN PREGNANCY

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1. Guerriero, W. F.: *Texas State Jour. Med.*, 45:274, May, 1949.
2. Dieckmann, William J.: *Quart. Rev. Obst. & Gynec.*, 10:14, Jan., 1952.

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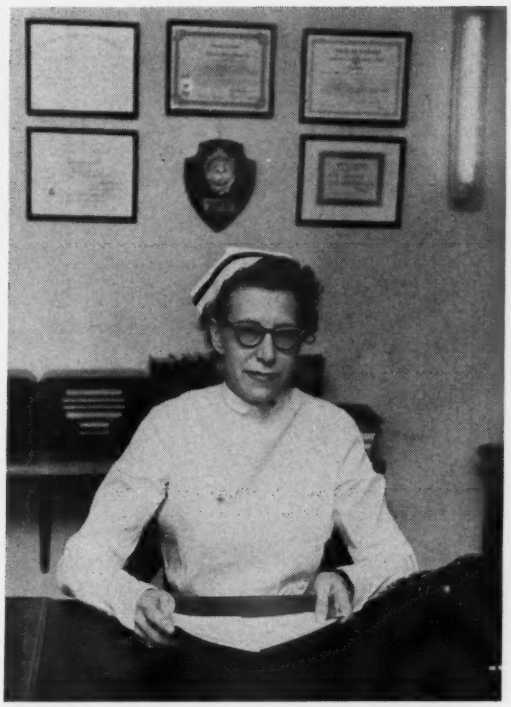

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The Management of Interstitial Cystitis

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One of the most painful and distressing diseases of the human urinary bladder is that of interstitial cystitis or Hunner's ulcer. This condition has been known by many different names, but it is most often referred to as Hunner's ulcer, elusive ulcer, or interstitial cystitis.

HISTORY

A review of the literature will show the multiplicity of terms used to describe that which is apparently the same condition. Thus Cullen[1] describes the condition as elusive ulcer and Skene[2] as interstitial cystitis. The Mayo Clinic has used the terms panmural fibrosis and submucous ulcer. Cystitis parenchymatosa, paracystitis, ulcus simplex, bladder fissure, irritable female bladder, ulcerative cystitis, Hunner's ulcer, circumscribed panmural cystitis, elusive ulcer, submucous ulcer, and interstitial cystitis have all been used to describe the same condition.

The term interstitial cystitis was probably first used by Skene in 1887, although Mercier[3] called attention to ulcers in the bladder in 1836. In 1870, Tait[4] also described the condition. A rare type of bladder ulcer in women was described by Hunner[5] in 1914, and the condition is often referred to in present day literature as Hunner's ulcer. In 1938, Kretschmer[6] reported a series of 138 cases of elusive ulcer of the bladder and did much to bring the condition to the attention of the profession. Nelson and Pinard,[7] Meisser and Bumpus,[8] Hinman,[9] Furness,[10] Hughes,[11] Peterson and Hager,[12] Folsom,[13] Higgins,[14] Fowler,[15] Dodson,[16] Seaman,[17] and many others have written on the subject.

ETIOLOGY

The etiology is unknown. Many theories have been advanced as to why the condition occurs, but at present, nothing has been proved. Hunner was of the opinion that many of these patients had ureteral stricture or renal infection. Rosenow and Meisser[18] thought that streptococci of certain strains were responsible. They cultured streptococci from abscessed teeth of patients suffering with elusive ulcer and inoculated teeth of animals with the bacterial suspension, and some of these animals developed the bladder condition. They also injected rabbits with streptococci from dental abscesses in patients suffering from the disease. Kretschmer was not able to demonstrate any relationship between the condition and distant foci of infection. I have always felt that the etiology was due to disturbance in the nerve supply to the bladder.

PATHOLOGY

The pathologic changes are those seen in chronic inflammation such as polymorphonuclear and round cell infiltration and fibrosis. This is most marked in the submucosa. In certain areas the perivascular infiltration is quite noticeable. The bladder wall becomes thick as a result of fibrous tissue replacement.

The condition occurs much more often than it is recognized. The lesion is difficult to see and, unless one has the disease in mind because of the history, it is apt to be overlooked.

SEX

Interstitial cystitis occurs much more often in females than in males. In my series of cases it was present in females in 98 per cent of the cases. About half of the patients are unmarried. However, it does occur in males, and I have two men with typical interstitial cystitis under treatment at this time.

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AGE

The disease is one of adult life. It rarely occurs in those under 21 years of age. In my series the youngest was 28 years while the oldest was 78 years of age. Most of the patients were between 45 and 60 years of age.

DIAGNOSIS

All of the patients were of a definite type as to nervous make-up. Whether the ulcer made them nervous or whether the nervous condition of the patient played a part in the etiology of the disease, I am unable to say.

All of my patients were well nourished and appeared quite healthy. In fact, they had few complaints except the bladder symptoms. It was interesting that 80 per cent of them had been labeled as neurotics by their physicians because of a clear urine and negative physical findings. Many had undergone cystoscopy and the condition had been overlooked.

While the history and symptoms are so characteristic that any patient with known Hunner's ulcer can make a diagnosis on a friend who has similar symptoms, it is one of the most mis-diagnosed bladder conditions known.

Most of the patients will have had their symptoms for many years before the diagnosis is made. There are two reasons for this. In the first place, the urine is quite clear, and analysis does not reveal evidence of bladder disease. In the second place, the condition usually occurs in adult females, and since many of these women complain of frequency and pain from urethritis, a careful study is not made.

The history is of utmost importance in diagnosis. Nocturia is a constant finding, and these patients suffer from loss of sleep and rest at night. They may void from every 15 minutes to 5 or 8 times a night. Frequency during the day is also a constant finding due to the decreased bladder capacity of these patients. One of my male patients was a rancher whose disease almost made him an invalid. He was compelled to stop attending farm meetings and church. He could not work. Another male patient was a dentist. He was forced to excuse himself every few minutes from his dental chair. This made working an almost impossible chore.

Characteristic of the disease is severe pain when the bladder is distended, relieved when the bladder is empty. As the bladder fills, the pain returns. Usually these patients point to a definite area when asked to locate the pain. Unless secondary infection is present, the urine is clear and they have very little pain or burning on voiding. Rather, they anticipate voiding as a means of relief.

Gross hematuria has been described as a symptom, but I have rarely seen gross hematuria in a patient who has not had treatment of some type. After treatment, gross hematuria is fairly common.

Most of the patients give a history of having had the condition for several years and of having been treated with no results.

CYSTOSCOPIC APPEARANCE

At cystoscopy, when the bladder capacity is measured, it will be found to be greatly reduced. The capacity may be only 2 or 3 ounces, or it may be 5 or 6 ounces if the ulcer is not far advanced. When the bladder is distended to capacity, severe pain will result. The bladder mucosa may appear normal except for the presence of a pinpoint size lesion which is usually located on the anterior wall of the bladder. The ulcer may be a single one, or there may be two or three present on opposite sides of the bladder. The lesion is usually small and appears as a lineal crack in the mucosa. There may be stellate radiations of redness from the ulcer. The area is painful if touched with the beak of the cystoscope and will bleed on distention of the bladder over its accustomed capacity. A stricture of the urethra or ureteral orifices may be present, or no other pathology may be found. The lesion must be differentiated from tuberculosis of the bladder, but the two conditions are so different that they are not confused by the trained cystoscopist. Smears, cultures, and guinea pig inoculation will rule out tuberculosis as a rule.

TREATMENT

Many forms of treatment have been used, but there has been no standard form. The ulcers have been resected by open operation but often recur in another area of the bladder. Fulguration is often used, but it has been my feeling that repeated fulguration leads to severe scar formation and loss of elasticity of the bladder. It is not without danger of rupture of the bladder. Presacral neurectomy has been tried. Injections of the ulcer with alcohol or nocovain are common.

I have obtained good results from overdistention of the bladder with water at cystoscopy under sodium pentothal anesthesia. The advantage of using sodium pentothal rather than spinal anesthesia is that it is almost impossible to rupture a bladder by distention under sodium pentothal. Even under deep anesthesia, the patient will arouse and move when the bladder is distended as far as it is safe to distend it. This awakening under sodium pentothal is almost diagnostic of interstitial cystitis in itself. While distending the bladder, one may watch the ulcer crack and bleed under direct vision of the cysto-

scope. The bladder is dilated and measured as to capacity after each dilatation. Finally, the point of maximum dilatation is reached (bleeding and pink tinged wash water).

If the bladder capacity before the procedure was 4 ounces, one may dilate the bladder up to 8 or 10 ounces. Following this, a catheter is anchored in the bladder and one-half ounce of one-fourth per cent Surfacaine is instilled, followed by one ounce of 2 per cent silver nitrate. The bladder is kept at rest on catheter drainage for a week. I believe it is just as important to keep the bladder at rest following this treatment as it is to keep a lung at rest in the treatment of pulmonary tuberculosis. A fissure at the corner of the mouth or between the fingers will heal much faster if it is kept at rest. I start these patients on Banthine, 50 mg. four times a day, by mouth. If there is secondary infection, I also give antibiotics depending upon the type of infection present.

The patients continue on Banthine therapy after going home from the hospital. As a rule I ask them to return for further treatment in one month if necessary.

I have tried Banthine alone and dilatation of the bladder alone. While Banthine does more to relieve pain than any drug I know of, it does not tend to make a 16-ounce bladder out of a 2-ounce bladder. I personally feel that the combination of the two methods of therapy, along with adequate catheter drainage, gives excellent results. Next to the prostatic who has good results from operation, these patients are the most grateful people in the world.

ACTH and cortisone have been used with fair results. However, in my hands the results were not spectacular, and there is some danger in their use. Hunner noted 42 per cent recurrences following partial cystectomy and advised more palliative treatment. Folsom operated on many patients by this method and reported good results. Nesbit[19] used anterolateral cordotomy in some cases and obtained results that made him believe it was justified in certain instances. Others have used uretero-intestinal anastomosis without cystectomy with good results.

It is my feeling that the conservative treatment which I have outlined makes radical procedures unnecessary. Dodson advised the method of treating the bladder with silver nitrate and local anesthesia in 1926, and no risk is attached to its use. Banthine is also harmless and may be used for prolonged periods of time. The constant movement of the bladder tends to prevent healing of the ulcers, and prolonged catheter drainage allows the ulcer to heal.

PROGNOSIS

I never tell the patient with interstitial cystitis that I will cure him. Many factors govern the prognosis. The number of ulcers present and the size and depth influence the results obtained. A small contracted bladder will be more difficult to dilate than one which holds 6 or 8 ounces. A bladder which is contracted from repeated fulgurations will be more difficult to treat. However, I have obtained excellent results in all cases from the treatment outlined. As a rule, pain is gone and frequency is improved after the first treatment. The patient is treated again in one month to six weeks, the intervals between treatment being lengthened as the patient improves and the bladder capacity increases toward normal. After a few months, many of them will be able to get along without bladder treatment and can be kept comfortable on Banthine alone. They should be kept under constant observation. I feel it is important that the details of the disease be explained to the patient and that he understand what you are endeavoring to accomplish in the way of treatment.

SUMMARY

1. The diagnosis and management of patients with interstitial cystitis is presented.

2. Treatment consisting of bladder dilatation, Banthine therapy, and catheter drainage is advocated.

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The Treacherous Right Colon

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Tumors in the region of the cecum and ascending colon have frequently been referred to as being "silent" in character. Carcinoma in that region frequently is far advanced before a diagnosis is made, and I am sure many of us have had the experience of taking care of patients who reported to us as soon as their symptoms occurred and then at operation we found an advanced malignancy. Carcinoma of the cecum and ascending colon is a treacherous lesion from a diagnostic standpoint because sometimes our routine x-rays and other studies fail to aid us.

It is the purpose of this paper to review the signs and symptoms of carcinoma of the right colon and to re-emphasize the importance of early diagnosis and treatment. Four cases will be presented to show some of the early symptoms and to illustrate that even the earliest treatment possible is frequently too late.

It is true that symptoms of carcinoma of the large bowel depend on the location. Ravdin and Bender,[1] in reviewing 286 cases of carcinoma of the colon, reported the following presenting symptoms for cancer of the cecum and ascending colon.

	Per Cent
Indigestion	78
Silent tumor	18
Blood seen by patient	14
Diarrhea	4
Tumor palpable	56

Rankin and Graham[3] state that symptoms of carcinoma in the right side of the colon may be classified under three main groups: (1) so called "dyspepsia," mild in character with few localizing symptoms and usually diagnosed as chronic appendicitis or chronic cholecystitis, (2) profound anemia, loss of weight, and loss of strength, and (3) a mass accidentally discovered in the right iliac fossa.

Approximately 13 per cent[1] of malignancies of the colon occur in the right side, and 35 per cent occur in the region of the hepatic flexure. This is fortunate because those occurring in other portions of the colon are probably more easily diagnosed and their symptoms may occur earlier. It is important to remember that over 50 per cent of all cancers of the large bowel and rectum can be felt with the examining finger in the rectum.

It has been shown[4, 5] that 10 to 15 per cent of patients who have carcinoma of the right portion of the colon have undergone only appendectomy within the duration of the symptoms of the malignant process. One of the cases being presented had undergone appendectomy just six weeks prior to resection. It is important to keep this in mind in doing appendectomies on older people, as an incision should be made large enough to allow a good look at the cecum. On the other hand, younger people may have a mass in the cecal area which may turn out to be inflammatory secondary to an appendiceal abscess. One should always keep in mind inflammatory lesions of the colon or terminal ileum.

In one of the cases presented the patient revealed marked anemia with weakness and fainting. When anemia is found with no definite explanation, one should look for a malignancy of the right colon. Frequently oozing is present from the raw surface of the lesion and a definite anemia is present.

In doing x-ray studies on the colon the surgeon should always inform the roentgenologist that he is looking for a malignancy. Sometimes it is necessary to do more than one study to reveal the defect caused by the tumor. Frequently the evidence of carcinoma is not shown unless the barium is seen to flow around and over the tumor.[5] If an ascending lesion is present in the cecum, it is frequently difficult to get barium past the defect without putting it under pressure.

In diagnosing carcinoma of the right colon one should always keep in mind the secondary adenocarcinoma of the large bowel in cases of chronic ulcerative colitis.[6] The primary change may take place in the right side as well as any other portion of the colon. Polyps of the right colon may also change into malignant disease. After a diagnosis of right colon malignancy is made, it is a good idea to sigmoidoscope the patient in search of other lesions in the sigmoid and rectum, as multiple lesions may occur. The patient should be prepared for bowel resection. There are many antibiotics and other drugs which have proved to be reliable. The mortality rate for colon resection has been lowered considerably in the last few years. The bowel should be cleared of fecal material, accomplished by giving mineral oil, enemas, or mild saline cathartics. Each case may present a different problem in preoperative preparation, and enough time should be spent to prepare the patient.

The most popular type of treatment now of course

* Submitted under the auspices of the Wichita Research Foundation. From the Surgical Service of St. Joseph-Wichita Hospitals.

is wide resection of the lesion. It is usually customary to resect the terminal ileum, cecum, ascending colon, and hepatic flexure with as much blood supply and lymphatics as possible. However, in doing this one should not cause any harm to the blood supply of the remaining bowel. It is of utmost importance to visualize the right ureter and not injure the structure itself. The surrounding loose areolar tissue should not be stripped away from the ureter, and it should not be isolated. It is also wise to recognize the duodenum so there is no injury when the right colic artery is dissected and divided. If the ureter is not protected and if its blood supply is destroyed, a slough may be produced and the kidney may have to be sacrificed. An end-to-end or end-to-side anastomosis is done; either is satisfactory.

The following case histories are presented to emphasize early diagnosis and careful study and to stress the fact that lesions of the right colon are "treacherous."

Case 1, Mrs. M. F., age 39, white female, was admitted to St. Joseph Hospital in August, 1951, with an attack of right lower quadrant pain. At that time she gave a history of starting to have attacks of pain in the right lower quadrant in July, 1951. She was observed for appendicitis, a diagnosis of gastrointestinal disturbance was made, and she was allowed to go home.

The attacks of pain continued at intervals, and I first saw her on February 14, 1952. At that time she complained of a lump coming up in the right lower quadrant and of cramping pains in that location, also nausea and constipation. Upon examination a movable hard mass approximately 2½ inches in diameter was felt in the right lower quadrant. This was slightly tender. The remaining examination was normal. Laboratory findings revealed some occult blood in the stool, and an x-ray of the colon was reported as showing no pathology.

Surgery was advised, but she wanted to go home for a while and this she did. I saw her again in the home on February 27, and at that time she was vomiting and had the right lower quadrant pain. The mass was more prominent, and a localized distention was present. She was hospitalized and prepared for surgery. On March 3 she was taken to the operating room where a napkin ring lesion was found just above the iliocecal valve. Regional lymph nodes were involved. A wide resection was done and an end-to-end anastomosis carried out. The pathological report was adenocarcinoma of the bowel, mucoid type, with metastasis to mesenteric lymph nodes.

Convalescence was smooth and uneventful.

Case 2, Mrs. N., age 69, white female, was admitted to St. Joseph Hospital December 19, 1951. She complained of intermittent attacks of right lower quadrant pain, nausea and diarrhea. She felt that nothing was going through her intestine. She also complained of severe distention. Approximately six weeks prior to admission she had been in another hospital where an appendectomy was done, and she was admitted to this hospital with the same complaints she had had when admitted to the other hospital.

A colon x-ray had been done prior to her operation at the other hospital. It revealed nothing of marked importance. A colon x-ray was repeated here, and findings were suggestive of a tumor mass and probably infiltration extending into the cecum and into the proximal ascending colon.

This patient was anxious for surgery as she wanted to get well so she could return to work. She was prepared for colon surgery and on December 31, 1951, was taken to the operating room where a lesion was found just above the iliocecal valve. The cecum was markedly distended, the terminal ilium was distended, and the right tube and ovary were adherent to the lesion. A wide resection was done, and the right tube and ovary were removed. Metastatic glands were found along the right colic artery, and these were removed. An end-to-end anastomosis was carried out.

Her symptoms were relieved and her convalescence was smooth. She has returned to work. The pathologist reported adenocarcinoma of the cecum with metastatic glands.

Case 3, N. J. B., age 78, white male, was admitted to Wichita Hospital May 2, 1950. He was first seen in the home, complaining of nausea, vomiting and weakness. He had fainted several times and had wanted to sleep much of the time for three to four weeks prior to admission.

Examination revealed a pale, elderly man with a smooth, oval, movable mass in the right lower quadrant. He also had a large hydrocele on the right side.

On admission his RBC was 3,250,000 with 51 per cent hemoglobin. Colon x-rays revealed a filling defect in the ascending colon. He had signs of cardiac decompensation and was treated for that condition. He was prepared for surgery and operated on May 23, 1950. A large mass was found approximately 4½ inches distal from the iliocecal valve. A right colon resection was done and an end-to-end anastomosis carried out. His convalescence was uneventful except for a mild phlebitis in the left leg. The pathology report was mucoid adenocarcinoma with enlarged inflammatory nodes (not metastatic).

There is no evidence of recurrence at this time.

Case 4, Mrs. B. P., age 50, white female, was admitted to St. Joseph Hospital April 18, 1952. Her main complaint was "gas." She had noticed some

soreness in the right lower quadrant for approximately three weeks, and she had discovered a lump in that area about two weeks previously. Colon x-rays were taken and revealed a suspicious tumor area in the cecum.

Examination revealed a movable tender mass approximately 2 inches in diameter in the region of the cecum. She was not anemic and appeared to be in good health. The pelvic examination was essentially normal.

After sufficient preparation she was taken to the operating room where a right colectomy was done with an end-to-end anastomosis. Enlarged glands were found along the right colic artery. The distal 8 inches of the ileum were removed. Her postoperative convalescence was uneventful, and she was dismissed from the hospital April 27, 1952. The pathological report was adenocarcinoma of the cecum, and the enlarged glands revealed only inflammation.

DISCUSSION

Carcinoma of the right colon should be kept in mind when examining a patient complaining of indigestion or "dyspepsia." A careful physical examination and a good history are of utmost importance in making a diagnosis. As pointed out, 10 to 15 per cent of patients with carcinoma of the right colon have had only appendectomy within the duration of their symptoms. This certainly should be kept in mind when doing an appendectomy on older people.

In the cases presented one of the patients had previously been operated on for appendicitis, and another had been placed in the hospital for observation for a gastrointestinal disturbance. One patient was first seen after he had fainted because of anemia, and the other was seen after she had noticed a lump in the right lower quadrant of the abdomen. Three of the cases presented were carcinoma of the cecum, and the other was carcinoma of the ascending colon. Some writers have advised a "second look" at some patients who have metastatic glands. The youngest of these patients may warrant such a procedure.

SUMMARY

1. Malignancy of the right colon is discussed.

2. The importance of early diagnosis and early treatment is emphasized. Certain technical points are stressed to prevent surgical difficulties.

3. Four selected cases have been presented to show how easy it is to overlook the disease.

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Histoplasmosis: Review of Literature and Report of Two Sisters Having Pulmonary Evidence of the Disease

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Cecil[1] defines histoplasmosis as being characterized by emaciation, splenomegaly, hepatomegaly, leukopenia, anemia and irregular pyrexia. Darling,[2, 3, 4] in 1906, accidentally observed on microscopic examination of necropsy material some unusual intra- and extracellular oval bodies which he named Histoplasma capsulatum in the belief that they were protozoa similar to the causative agent of kala-azar. Three years later he reported three additional cases. In 1926, Watson and Riley[5] reported the fourth case, and Phelps and Mallory[6] reported a fifth case in the same year. In 1928, a sixth case was reported by Crumrine and Kessel.[7] In 1934, Dodd and Tomkins[8] reported the first case of histoplasmosis diagnosed before death. In the same year, DeMonbreun[9] was able to culture the microorganism and to classify it definitely as a fungus.

The indication at present is that the disease is not communicable from person to person; however, this point is not definitely settled. A possible method of infection constitutes: (1) dissemination by floods in the Mississippi Valley of the soil-fungus mixture, and (2) after drying, by winds resulting in airborne infection.[10] Emmons[11] reported in 1949 the presence of H. capsulatum in both soil and rats in an endemic area.

Histoplasmosis is found in almost every state in the union and in many foreign countries; however, the largest number of cases seems to be from the central United States, principally the Mississippi River Valley. Beadenkopf and Loosli[10] found from skin test surveys in this area that infection with histoplasmosis frequently exceeds 50 per cent, and in certain counties in Illinois adult young men and women have shown rates of sensitivity of over 95 per cent. Christie and Peterson[12] tested 344 children and young adults in the state of Tennessee: 73.2 per cent reacted to histoplasmin; 21.5 per cent reacted to tuberculin, and 53.2 per cent had interthoracic shadows interpreted as calcifications.

Clark, Tempel and Allen[13] studied 1,511 patients with the initial diagnosis of tuberculosis at Fitzsimons General Hospital in 1948. One hundred ninety-two, or about 12 per cent, were found not to have tuberculosis, and of these 11 were diagnosed as having fungus infections of the lung. Furcolow[14] found the over-all prevalence among negroes was only 1.2 per 1,000, as compared with 4.5 per 1,000 among white children. There was a steady rise in rates among white children from 0 per 1,000 in the youngest age group to 10 per 1,000 among the age group of 16 to 18 years. Hodgson et al[15] found 123 recorded cases up to 1949; of these 62 had pulmonary involvement and one-sixth of the patients were under one year of age. The males outnumbered the females 2 to 1.

In another study by Absher and Cline,[16] of 1,000 cases of pulmonary calcifications, they found that 55.8 per cent reacted to tuberculin, 22.6 per cent reacted to histoplasmin, and 6.5 per cent reacted to coccidioidin.

Parsons[17] gives the most common signs and symptoms in the order of their decreasing frequency as: fever, hypochromic anemia, hepatomegaly, splenomegaly and lymphadenopathy, anorexia and loss of weight, ulceration of the oral mucosa, and various types of cutaneous lesions, with ulceration of the pharynx and larynx occurring frequently. Love[18] gives the cardinal findings in the full-blown infantile type of histoplasmosis as:

1. Fever, which may be of a low-grade, irregular or septic type.
2. Splenomegaly and hepatomegaly. Enlargement of superficial lymph nodes is not generalized nor prominent in infants.
3. Pulmonary involvement.
4. Skin lesions are not uncommon. Petechiae, purpuric hemorrhagic areas and ulcerative lesions are fairly common.
5. Blood count shows characteristic changes; i.e., progressive anemia, leukopenia and often thrombocytopenia.

Sontag and Allen[19] tested 170 children in Southwestern Ohio with serial x-rays at 1, 6, 12, 18, 24 months and yearly thereafter. Thus they were able to study the development of calcified lesions in the chest. Of these children 15.3 per cent reacted to

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tuberculin and 44.7 per cent to histoplasmin; 60.8 per cent had demonstrable pulmonary calcifications. These authors and Christie and Peterson[12] emphasize that the increasing incidence of pulmonary calcifications is much more rapid and far exceeds the rate of increase in positive tuberculin reactions. There is a striking similarity to histoplasmin and calcification curves, and a non-similarity between tuberculin and calcification curves. Thirty-three children with pulmonary calcification reacted neither to tuberculin nor histoplasmin, and it was assumed that other etiological factors or agents were responsible for this. One of the 33 children reacted to haplosporangin and two to blastomycin. When one pair of siblings had calcifications, the other had calcification in 43 per cent of the cases, against a normal expectancy of 37 per cent. When one sibling was negative, the other was negative in 22 per cent of the cases, against an expectancy of 15 per cent. There was no significant difference in the histoplasmin skin testing of siblings.

Studies of serial x-rays revealed that infection preceding calcification often occurs at a very early age; that there is a considerable lag between the initial soft tissue lesion in the parenchyma and calcification, a lag of two years or more between a soft tissue lesion and a hilus calcification; that the process is often a progressive one over a period of six or more years, and that calcification itself often appears early. They were unable to distinguish the calcification patterns of positive histoplasmin and tuberculin skin reactors. The majority of these children had their soft tissue changes before 48 months of age.

Parsons,[17] Weed,[20] and Miller[21] have described in detail the pathologic, mycologic, and postmortem findings of histoplasmosis. Briefly, the yeast-like forms of the fungus characteristically attack or are attacked by the cells of the large macrophage or reticuloendothelial system. At autopsy the organs found to be involved in order of frequency are: spleen, liver, visceral lymph nodes, lungs, bone marrow, oral mucosa, adrenals, gastrointestinal tract, peripheral lymph nodes, kidneys, and larynx. Any or all of the remaining organs may be involved.

Raftery[22] examined 436 appendices, comprising all cases of chronic appendicitis, lymphoid hyperplasia and normal appendices of children 16 years of age and under; 54 of these were found to contain H. capsulatum. All of the involved appendices were the site of marked follicular hyperplasia, and the enlarged follicles showed phagocytic mononuclear cells which contained from 1 to 20 organisms per cell.

In reviewing the clinical histories of the involved cases, it was found that all but 4 of the children showed some evidence of chronic illness. Thirty-six ran a low-grade fever during hospital stay, 30 gave a history of recurrent abdominal pain and nausea for from 3 years to 3 months prior to surgery. Seventeen of the 23 with follow-up histories had recurrence of abdominal pain, fever, or other evidence of chronic illness. In 8 cases, x-ray revealed enlarged hilar nodes, calcification or mild diffuse infiltration. Two of the children developed lymphoblastoma within 12 months following surgery. Autopsy was refused on one, and the autopsy on the other child showed a lymphoblastic lymphoblastoma with accompanying infection of H. capsulatum. A brother of one of the patients died of lymphoblastic lymphosarcoma 3 months prior to his sister's surgery. Cawley and Curtis[23] also found a high unexplained incidence of histoplasmosis associated with lymphoblastoma.

Rawson et al[24] have found 19 reported cases of involvement of the adrenal glands by Histoplasma capsulatum. Of these, 12 showed some degree of destruction of the adrenal parenchyma, and in 9 there was massive destruction of such magnitude as to cause death. In cases of adrenal failure due to histoplasmosis, a ratio of 2 males to 1 female was found. This is the same ratio as in Addison's disease from all causes. Despite its infrequency, histoplasmosis should be kept in mind in any differential diagnosis of Addison's syndrome. Weed[20] reported a case of histoplasmosis in an 8-months-old infant in whom every organ and tissue was involved to some degree. In the adrenal gland the yeast forms appeared to be actually invading the cortical cells.

Miller[21] states that in one-half of the reported cases cutaneous or mucomembranous lesions have been found.

Hodgson et al[15, 25] reviewed all the reported cases to January 1, 1950. They found 138 authenticated cases. In 65 cases there was proved pulmonary involvement. There were 92 males and 39 females; ages ranged from 7½ weeks to 77 years; one-sixth were less than 1 year old. Forty-three per cent of the cases were diagnosed during life. Histoplasmin skin test was performed on 31 patients, and only 16 reacted positively. They found the skin test gave positive results on a large portion of the normal population and negative results on one-half of those with the disease, and they found it difficult to see the value of this test.

High, Zwerling, and Furcolow[26] have studied more than 100 cases of disseminated pulmonary calcification, including miliary calcinosis in which approximately 90 per cent were positive to histoplasmin. Among these instances of disseminated calcification, 12 occurred in 6 pairs of siblings. They also found a few instances of splenic calcifications in tuberculin-negative, histoplasmin-positive children. So far, all their cases of splenic calcification involve pulmonary calcification. They could not say whether or not the

splenic calcification is evidence of disseminated histoplasmosis.

Bass[27] reports that "snowstorm" calcifications in the lungs, seen in some patients with histoplasmosis infection, are evidently dissemination of hematogenous origin. According to Silverman[28] and Parsons,[17] histoplasmosis has previously been considered a rare, universally fatal disease; it is now recognized as a disease of wide distribution, generally nonfatal, and often asymptomatic.

Despite the possibility that other fungi may result in histoplasmin sensitivity, a positive skin reaction in an individual with roentgen signs of pulmonary infection, who lives within the histoplasmin area, places histoplasmosis high if not first on the list of differential diagnoses. In attempting a differential diagnosis, one should remember that histoplasmosis mimics many more common diseases. It produces miliary lesions, ulcerations of the intestinal tract, and caseation necrosis which resembles closely the same lesions produced by tuberculosis. It causes enlargement of the spleen, liver, and lymph nodes such as one sees in leukemia and Hodgkin's disease. It has been confused with Banti's disease and atrophic cirrhosis. It produces ulcerative lesions of the oropharynx and larynx, and in several instances the clinical diagnosis before autopsy was carcinoma. It has been the cause of vegetative endocarditis. The leukopenia and anemia must be differentiated as to causation from aleukemic leukemia and other blood dyscrasias. In cases of extreme hypotension, histoplasmosis must be thought of as a possible cause of adrenal insufficiency. Some features of the disease closely resemble the leishmanian infections, kala-azar, cutaneous leishmaniasis, and espundia.

Zwerling,[29] in a survey of student nurses in 10 cities throughout the country, showed a close parallel of sensitivity to histoplasmin with pulmonary calcification. There was no significant parallel with reaction to tuberculin. A distinction by roentgenography between tuberculin-positive, histoplasmin-negative calcification and tuberculin-negative, histoplasmin-positive calcification could not definitely be made. However, disseminated bilateral calcification is more frequently associated with a positive reaction to histoplasmin than with one to tuberculin. Hodgson[25] says there is no characteristic x-ray evidence of histoplasmosis, and it may resemble any lesion of the lungs.

Hodgson[15] also found 62 cases of proved pulmonary involvement in 123 cases of histoplasmosis. He found the skin test was without value to the clinician, and the complement fixation and precipitin reactions were unreliable procedures because of cross reactions with other fungi. The evidence presented by this study was that lesions (in the lungs) tend to become calcified within a few months if healing occurs.

Three criteria have been established by Furcolow[14, 30] for possible subclinical cases of histoplasmosis: (1) the individual has skin sensitivity to histoplasmosis but not to tuberculin; (2) the lesion must persist at least two months; and (3) laboratory and clinical examinations must exclude the presence of tuberculosis and other conditions such as sarcoidosis or Hodgkin's disease.

He divided disseminated pulmonary calcifications into two groups: (1) Miliary calcification. These calcifications are small, round, uniform in size, numerous, and widely and symmetrically scattered throughout each lung field. This type is sometimes called "wheatena" or "buckshot" calcification. Most observers feel that the miliary type results from hematogenous dissemination of the causative agent. (2) The second group is designated multiple bilateral calcification. In these instances the calcaneous deposits are fewer in number, often irregular in outline, of varying size, and often distributed in an asymmetric pattern. This type is probably due to bronchogenic dissemination. Histoplasmosis or some closely related infection, not tuberculosis, is the cause in most cases of disseminated pulmonary calcification.

Groover et al[31] studied a group of 1,220 soldiers during demobilization at the end of World War II. These soldiers were skin tested with tuberculin, histoplasmin and coccidioidin. They all had roentgen evidence of pulmonary pathology compatible with that of tuberculosis. It was shown that 93.6 per cent were sensitive to tuberculin, 31.1 per cent to coccidioidin and 58.6 per cent to histoplasmin. They concluded that the test of sensitivity of the skin to histoplasmin is of limited value in the differential diagnosis of pulmonary disease.

Pratt,[32] in a study of 23 cases, found 11 to have H. capsulatum on examination of the bone marrow.

In 60 cases reported by Hodgson,[15] one or more cultures were made, and the organism was recovered from at least one culture in 53 of them.

Zahn[33] had a proved case of histoplasmosis in which the histoplasmin complement fixation test was negative. He points out that negative serological studies do not necessarily eliminate histoplasmin as the etiological agent; there may be a similar reaction as that which occurs in quiescent coccidioidal lesions in which the complement fixation tests are usually negative.

Treatment: There is no known cure for the average case of histoplasmosis. Penicillin[34] has been tried without success. Seabury [25] reports treating two patients with stilbamidine (as used in kala-azer and trypanosomiasis), which gave a temporary improve-

ment but did not modify the course of the disease to a significant degree.

Hodgson[15, 25] reported two cases of pulmonary histoplasmosis which were apparently cured by lobectomy.

Recently, Christie et al[36] have used ethyl vanillate with better results than any drug or treatment yet tried. They treated 12 consecutive, culturally proved cases of histoplasmosis, representative of the progressive disseminated form of the disease. Five of these patients survived and have continued well.

CASE HISTORIES

F. N., a girl of 18, was born in Argyle, Iowa, moved to La Plata, Missouri, in 1937, thence to Strong City in 1942, and finally to Newton in 1945. She had had the usual childhood diseases and occasional colds. She was first seen in the office in November, 1950, complaining of pain in the lower right chest upon deep breathing. There was no temperature, no physical findings. It was thought this was pleurisy, and a routine chest film was taken. The chest x-ray showed multiple, discrete, widely scattered calcified areas in both lung fields. A further study of this girl and the other members of the family was done at the time the positive x-ray findings were discovered. Past history shows a chest x-ray taken in 1948 and again in 1949 by the state in a survey of school children. Both were reported negative. Skin tests at this time were histoplasmin* weak and tuberculin negative.

At the time of the present study urinalysis was negative, hemoglobin 12.8 gms., RBC 4,230,000, WBC 5,000, polys 74, lymphs 26. Sedimentation rate was 18 mm. Serology was negative, and agglutination for typhoid "O" and "H," paratyphoid A and B, brucella, Weil-Felix reaction and B. tularense were all negative. Gastric washings were negative for acid fast bacilli on both smear and culture. Skin tests showed histoplasmin 4 plus, tuberculin negative, coccidioidin negative. Complement fixation test for histoplasmosis was negative. Serial x-rays taken since, over a period of one year, have shown no change from that in the original film. She has remained in good health (Figures 1 and 2).

L. N., a sister, is a girl of 19, born in Argyle, Iowa. She moved to La Plata, Missouri, in 1937, then to Strong City in 1942, to Newton in 1945. She had had the usual childhood diseases of measles, mumps, pertussis, and chicken pox, but no other illness until she moved to Kansas and started to have almost continuous head colds. Aside from these colds she had never been ill and had never run a temperature above normal to her knowledge. In 1948 and 1949 her chest x-rays in a survey of school children were reported negative. Skin tests at this time were tuber-

* Histoplasmin and coccidioidin material for skin testing and the complement fixation tests for histoplasmosis was furnished by Dr. M. L. Furcolow, United States Public Health Service, Kansas City, Kansas.

Figure 1. F. N., November 24, 1950.

Figure 2. F. N., October 3, 1951.

culin negative and histoplasmin positive. In 1950, for this study, chest x-ray showed multiple, widely scattered, discrete, calcified areas in both lung fields. Skin tests were: histoplasmin 1 plus, tuberculin negative, and coccidioidin negative. A gastric washing was done in which concentration smear and culture were negative for acid fast organisms. Serology was negative. Agglutinations were negative. Hemoglobin was 11.6 gms, RBC 4,230,000, WBC 6,100, 60 per cent polys, and 40 per cent lymphs. Sedimentation rate was 22. The complement fixation test for histoplasmosis was reported negative. Serial chest x-rays for a period of one year have shown no change over the original (Figures 3 and 4).

A. N., a brother, was 14. Born in La Plata, Missouri, he moved to Strong City in 1942, then to Newton in 1945. He had had the usual childhood diseases, tonsillitis and adenoiditis at eight years of age, otherwise was never sick. In 1949 a chest x-ray was taken by the mobile unit of the state tuberculosis control division in a survey of school children and was reported negative. A skin test at this time was reported tuberculin negative. Histoplasmin was weak positive. In 1950, for this study, the skin test was histoplasmin negative, tuberculin negative, coccidioidin negative. The chest x-ray showed two small calcified areas near the base of the right lung. Complement fixation test for histoplasmosis was reported negative. A repeat x-ray three months later revealed no change.

L. N., a brother, 16, was born in Argyle, Iowa. He moved to La Plata, Missouri, in 1937, to Strong City in 1942, thence to Newton in 1945. At seven years of age he had had a severe sore throat; following this weakness developed in one leg, and a diagnosis of polio was made. He has completely recovered. At nine years of age he had a mastoid operation and an appendectomy shortly thereafter. At 10 years of age he had tonsillitis and adenoiditis. In 1948, and again in 1949, he had chest x-rays taken in a state survey of school children, and they were reported negative, as were also the skin tests for histoplasmosis and tuberculin. In 1950, for this study, chest x-ray was negative, but the skin tests were histoplasmin 2 plus (3 plus in 72 hours), tuberculin negative, and coccidioidin negative.

The father, Mr. N., was born in 1904 in Argyle, Iowa. He had had the usual childhood diseases. In 1939 he spent about one year in the San Joaquin Valley. He was in San Diego in 1942-43. He had hernia repair in 1942 and cholecystectomy in 1945. Otherwise, he had always been in good health. Skin tests in December 1950 were: histoplasmin 3 plus, tuberculin negative, and coccidioidin negative. Chest x-rays were negative at this time.

The mother, Mrs. N., was born in 1912 at Fort Madison, Iowa. She moved to Argyle, Iowa, at four or five years of age. In childhood she had the usual diseases, except mumps which she had with her children. She had had scarlet fever in early childhood, and an appendectomy in 1939, but no other illness. Skin tests in December 1950 were: histoplasmin 2

Figure 3. L. N., November 24, 1950.

Figure 4. L. N., August 4, 1951.

plus, tuberculin 1 plus and coccidioidin negative. Chest x-rays were negative.

CONCLUSION

1. A brief review of the literature concerning histoplasmosis and a bibliography have been assembled.

2. Cases of histoplasmosis in two sisters in the same family have been presented. While these cases have not been proven by culture or by a positive complement fixation test for histoplasmosis, they nevertheless fit the three criteria established by Furcolow and referred to in this paper, and must be considered cases of the miliary calcification type, asymptomatic, and probably healed.

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The Significance of Solitary, Asymptomatic, Intrathoracic Coin Lesions *

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Forty years ago when Adler published the first monograph on bronchiogenic carcinoma, he could find in the world's literature only 374 cases and apologized for writing about so rare a condition.[9] At present, this same disease is believed by some to be the most common visceral cancer in men,[9] constituting 6 to 10 per cent of all neoplasms.[12] The increased incidence of malignant pulmonary disease and its frequently incurable nature by the time symptoms are noticed make the early detection of pulmonary carcinoma of vital importance to every practitioner.

Evidence is now ample to suggest that asymptomatic pulmonary coin lesions may be the first evidence of significant intrathoracic disease, including bronchiogenic carcinoma. Such pulmonary densities are usually discovered in mass x-ray surveys, in casual fluoroscopic examination of the chest during gastrointestinal studies, or in chest x-rays taken as part of a routine physical examination. Yet because these lesions are unaccompanied by symptoms and occur in apparently healthy individuals, there is a tendency to regard them either with indifference or with an attitude of watchful waiting. Either attitude may be detrimental and, indeed, fatal to the patient.

The term "coin lesion" is used to describe a roughly spherical, well-circumscribed intrathoracic nodule seen on roentgenographic examination. Such lesions may be solitary or accompanied by other evidence of pulmonary disease, and may be symptomatic or asymptomatic. Somewhat arbitrarily, perhaps, the following discussion will be concerned only with those spherical densities which are solitary and asymptomatic.

DIAGNOSIS

Because such densities often represent malignant disease at its inception, it is imperative that they be recognized as significant lesions requiring immediate diagnosis. The possibility of carcinoma, tuberculous disease, fungous infections, abscesses, cysts, and benign tumors must be kept in mind. Diagnosis is usually difficult. Even when the physician exploits all his tools, an exact diagnosis often can be made only by recourse to an exploratory thoracotomy. Because time is so important a factor in the curability of cancer, the diagnosis must be arrived at promptly.

A careful clinical history must be taken, with particular attention to occupation, geographical areas occupied, and possible contact with active tuberculosis. Age is of less importance than might be supposed, for the occurrence of pulmonary carcinoma in individuals under 35 is not rare, nor is the occurrence of benign pulmonary lesions in those over 50.[13]

Physical examination rarely reveals signs of pulmonary involvement but may suggest malignant disease of extra-pulmonary organs. Solitary metastatic lesions of the lung, though rarer than solitary primary lesions, do occur, and the discovery of carcinoma in another organ suggests that the lung is already inoperable.

Roentgenologic examination, including fluoroscopy, laminography, bronchography, angiography, and serial observation, is perhaps the physician's best diagnostic aid. However, it bears emphasis that there is no definite roentgenographic pattern for pulmonary carcinoma and no criterion which will always enable the examiner to deduce the etiology of a roentgenographic density.[9, 12, 14, 15, 18]

Fluoroscopy will show shift of a lesion, diaphragmatic movement, and sometimes a fluid level within cavities. It also occasionally allows the accurate diagnosis of an intrathoracic fistula.[12]

Laminography is of value in localizing the lesion, in presenting areas of calcification, in showing cavitation, and sometimes in disclosing arteriovenous fistulas. The presence of calcium in the lesion may be considered as strongly supporting the diagnosis of a tuberculous or histoplasmic lesion or of a pre-malignant process such as a chondroma or dermoid cyst.[2, 12] Caution must be exercised in arriving at such a diagnosis, however, since calcification within a malignant lesion is not unknown. The absence of calcification carries little diagnostic import, for many tuberculous lesions do not present calcific areas roentgenographically, although they may be shown to have such areas grossly.[3] Cavitation can usually be seen where it exists grossly,[3] but it occurs in both malignant and benign lesions. Cavities within malignant processes are usually ragged in outline, while those

* This paper written while the authors were serving as externs at the Halstead Hospital, Halstead, Kansas. They are now junior students at the University of Kansas School of Medicine.

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within benign lesions present a smooth contour, but an accurate differentiation cannot always be made on this basis.

Bronchography may demonstrate the presence of bronchiectasis or of a bronchial block. It must be realized, however, that bronchography cannot reveal the etiology of the space-occupying lesion and that its failure to show a bronchial block in no way rules out the diagnosis of bronchiogenic carcinoma.

Angiocardiography has occasionally successfully visualized an arteriovenous aneurysm.[18]

In rare cases the physician will have access to chest x-rays taken several years before the one in question. If the lesion has remained stationary during this period, the physician can afford to be less concerned about malignancy, but under no circumstances is the physician justified in waiting to obtain serial x-rays in order to observe a change in size. An increase in size is not diagnostic, for it occurs in tuberculous lesions and suppurative processes as well as in malignant disease. Conversely, the fact that a lesion remains stationary is not diagnostic of a benign condition, for cases of malignant pulmonary lesions which have remained stationary for several months have been reported.[7, 8, 16, 18] Often it is in this period of cautious watchfulness that an operable lesion becomes inoperable.

One other roentgenographic pitfall is to be avoided. There is a strong temptation for the practitioner to label small, asymptomatic pulmonary lesions as "atypical" or "virus" pneumonia, treat the patient with antibiotics and take another chest x-ray one to three weeks later. On finding that the shadow has decreased in size, he may feel that his diagnosis is confirmed, prescribe more antibiotics, and become ill-advisedly complacent.

The significance of a pulmonary shadow caused by neoplasms should be recognized. Only rarely does x-ray outline the shadow of the tumor itself[9] and far more often is the density representative of the atelectatic result of neoplastic growth. Where atelectasis exists, infection is not slow to follow. It is in this way that the administration of antibiotics to individuals harboring malignant pulmonary neoplasms may diminish roentgenographic evidence of the tumor, at the same time having no effect on the fundamental disease process. The decrease in size of a pulmonary shadow after administration of antibiotics must never be considered conclusive proof that the pulmonary disease which exists is infectious in origin.[12]

Skin tests for tuberculosis, histoplasmosis, coccidiomycosis, blastomycosis, and echinococcus disease are respectable tools in the physician's armamentarium,[16] but they cannot be relied upon as accurate indicators of the etiology of a coin lesion. Although some investigators[2] feel that a positive skin test in the absence of other pertinent findings is sufficient to warrant observation rather than exploration, others demur.[5, 16] Certainly cases of concurrent active tuberculosis and pulmonary carcinoma have been reported,[12] and a positive skin reaction to tuberculin in the presence of bronchiogenic malignancies is not rare. Probably the safest course in such instances is to regard the coin lesion as a probable malignancy unless several findings are suggestive of some benign process.

Bronchoscopic examination and the study of bronchial aspiration are probably of little value. Negative findings are the rule because of the peripheral location of many of the lesions.[13, 15, 16, 18] Similarly, the finding of malignant cells in bronchial washings is usually diagnostic, but negative findings, which are most frequent, are valueless.[13, 18]

Examination of the sputum and gastric aspiration for the presence of tubercle bacilli, fungi, or malignant cells is probably of some value, but only occasionally is it in itself diagnostic.[15] Time should not be lost waiting for results of guinea pig inoculation or bacterial cultures.[14, 16, 18]

Aspiration biopsy of coin lesions is both difficult and dangerous and has been discarded by most practitioners as a diagnostic method.[12, 14, 18]

By demonstrating a layer of air between the chest wall and the lung parenchyma, a diagnostic pneumothorax can be helpful in distinguishing between intrathoracic extrapulmonary, and intrathoracic intrapulmonary lesions.[5, 12]

Blood counts and chemistry, serologic studies, and agglutination tests are rarely diagnostic when considered alone but may be helpful.

In summary, positive tests can be suggestive and sometimes diagnostic of the existence of a particular disease, but there are no tests which can prove the absence of a malignant process.[18] Even with the exercise of great diagnostic acumen, the physician will often be unable to arrive at a diagnosis by conservative methods and will be forced to resort to an exploratory thoracotomy. The alternative is watchful waiting in a situation where time may be of the essence.

MANAGEMENT

There are some exceptions to the general rule of exploration for all undiagnosed pulmonary coin lesions. Advanced age, markedly decreased respiratory function, and the presence of debilitating disease may make the risk and disadvantages of exploration outweigh the advantages.[18] Where serial x-rays reveal that a lesion has remained stationary for several years, there is no need for immediate exploration and possibly little advantage in eventual exploration. Finally, some investigators feel that the demonstration of calcification within a pulmonary lesion

is evidence sufficient to make thoracotomy unwarranted.[1, 18] Others, while agreeing that calcification almost always indicates a benign lesion, feel that these should be removed prophylactically, particularly when there is a reasonable suspicion of tuberculosis.[3, 16] With these possible exceptions, the exploration of all undiagnosed pulmonary coin lesions would appear to be the method of choice.

The risk which such a major surgical procedure carries with it is small with present-day techniques of anesthesia and surgery. In a series of 16 cases, Effler reported no operative mortalities and two postoperative complications.[7] One of these was a mild thrombophlebitis; the other, subcutaneous emphysema. Effler, Blades, and Marks report a series of 24 cases with a mortality and morbidity rate of 0 per cent, and they state that there is an expected mortality rate of less than 1 per cent.[8] Certainly mortality and morbidity rates are low—so low that exploratory thoracotomy now belongs with exploratory laparotomy as the procedure of choice in the management of undiagnosed but possibly dangerous conditions. And while the risks are low, the stakes are high, for bronchiogenic carcinomas occur with 10 times the frequency of benign pulmonary tumors.[5] Here, as in other conditions where cancer is suspected, the more drastic procedure is, in final analysis, the more conservative.

Interesting in this connection is the experience which Abeles and Ehrlich report.[2] In a series of silent coin lesions studied, 31 were undiagnosed, and exploratory thoracotomy was advised. Ten of the patients were not operated upon, three of them refusing operations because they were asymptomatic. Six of the 10 refused operations on advice of their family physicians, who counseled a "watch and wait" policy. One other patient was hospitalized and, after negative bronchoscopy, was referred to the outpatient department. This patient was later shown to have advanced pulmonary carcinoma. Of the nine remaining, four have been proved to have had pulmonary cancer.

While granting that the removal of malignant growths is highly desirable, the conscientious physician will be concerned about the percentage of patients he will have subjected to undesirable surgery. The number is small. Some of the benign lesions, such as adenomas and chondromas, are pre-malignant and undoubtedly should be resected in most cases. Many more of the resected lesions are tuberculomas and, because tuberculomas often harbor myriads of tubercle bacilli and are often refractory to medical therapy, the consensus is that surgical excision is the treatment of choice.[3, 5, 8]

Cases are not rare in which an apparently well-calcified and innocuous tuberculoma has remained stationary for years, only to act later as a center from which thousands of tubercle bacilli are diffused throughout both lung fields. Usually only excision can protect the patient from such explosive spread of his disease. For similar reasons, the surgical excision of localized tuberculous infection is the ideal treatment. Cysts, abscesses, and aneurysms, too, are best treated by surgery.[5, 19] Brewer, Jones, and Dolley, reporting a series of 30 cases of non-malignant intrathoracic lesions simulating bronchiogenic carcinoma, felt that "in 23 . . . cases . . . cure could not be expected by conservative treatment; six cases fall in a borderline group; one was hopeless regardless of treatment employed."[5] Fungous granulomas appear to be the only common intrathoracic lesions in which the desirability of resection is in serious dispute.[2]

The method employed at surgery varies somewhat with the surgeon. Sharp and Kinsella recommend that the biopsy be taken by means of a wedge resection rather than a local enucleation. The former possesses the advantage of less contamination when one is dealing with an abscess or tuberculoma. Depending upon the biopsy report, a subsegmental or segmental resection, a lobectomy, or a pneumonectomy is performed. If the lesion is malignant, the mediastinal lymphatics should be excised insofar as possible.[12] At the conclusion of the operation the chest wall is so reconstructed as to allow a maximum of respiratory function postoperatively.[14]

RESULTS

Table 1 shows the final diagnoses of 137 cases of solitary asymptomatic pulmonary coin lesions; 131 of

TABLE 1

FINAL DIAGNOSES OF 137 CASES OF ASYMPTOMATIC COIN LESIONS

Final Diagnosis	*Series* A (16)	B (18)	C (8)	D (2)	E (7)	*Total*
Bronchiogenic carcinoma	11	6	1	5	6	29
Tuberculoma		7	6	5		18
Tuberculosis, proven	6				8	14
Granuloma, undetermined etiology	10	3				13
Bronchiogenic cyst	6*		6			12
Hamartoma	5	2	1		1	9
Metastatic carcinoma	3	2	1	1	1	8
Tuberculosis, suspected	5					5
Bronchial adenoma	2	2		1		5
Fibroma	2	1				3
Abscess				2		2
Chondroma	1			1		2
Neurofibroma			1	1		2
Pericardial cyst		1		1		2
Lymphosarcoma	1		1			2
Diaphragmatic hernia			2			2
Bronchiectatic cyst				1		1
Arteriovenous aneurysm		1				1
Lipoid pneumonia				1		1
Neurofibrosarcoma			1			1
Fibrosarcoma of pleura				1		1
Echinococcus cyst	1					1
Thymoma				1		1
Caseous lymph gland			1			1
Cavernous hemangioma			1			1
Number of Cases in Each Series	53	25	22	21	16	
Total Number of Cases						137

* Two additional cysts were included in this series, but were symptomatic (bleeding).

the cases were subjected to exploratory thoracotomy. Twenty-nine, or 21.2 per cent, were found to be bronchiogenic carcinoma and 2.9 per cent sarcomas. Another 11.7 per cent were pre-malignant lesions (hamartomas, chondromas, and adenomas). A total of 35.8 per cent of the patients, then, were harboring malignant or potentially malignant lesions. Proved or suspected tuberculous lesions constituted another 27 per cent of the cases.

Mortality rates for all series are not available, but for those reported[7, 8] are zero.

A significant number of survival rates for explored cases of silent malignancies have not yet been reported. It is logical to assume, however, that the five-year survival rate in such instances will exceed that of any other internal cancer.[14] With such desirable prospects and such low mortality rates, hesitancy on the part of the physician in recommending surgical exploration of undiagnosed coin lesions appears unwarranted.

SUMMARY

Bronchiogenic carcinoma now constitutes six to ten per cent of all neoplasms.

Coin lesions, which are roughly spherical, well-circumscribed, intrathoracic nodules seen on roentgenographic examination, often represent malignant disease at its inception. It is imperative that they be recognized as significant lesions requiring immediate diagnosis.

Diagnosis must be arrived at promptly. When malignant disease cannot be ruled out, proper management consists of an exploratory thoracotomy.

Excepted from this generalization are patients of advanced age or debility, patients whose lesions have remained stationary for several years, and patients whose lesions show calcification.

The expected mortality rate in thoracotomies for undiagnosed asymptomatic coin lesions is less than one per cent.

Most of the benign lesions found at thoracotomy are best treated by surgical excision.

A composite of five series, consisting of 137 cases, reveals 25 different diagnoses. Of these cases, 21.2 per cent were bronchiogenic carcinomas, 2.9 per cent were sarcomas, 11.7 per cent were pre-malignant lesions, and 27 per cent were proved or suspected tuberculosis.

It is reasonable to expect the five-year survival rates of these asymptomatic cases of bronchiogenic carcinoma to exceed those of any other internal cancer.

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THE KANSAS PRESS LOOKS AT MEDICINE

Toward Better Medical Care

Dr. Louis H. Bauer, president of the American Medical Association, has outlined a thorough-going program for what he terms "the preservation of our American system of medicine." His constructive points, which are directed to all physicians and to all component societies of the A.M.A., include:

Work with rural communities to establish facilities for physicians, so that we shall have a better distribution of physicians.

See that good medical care for the indigent is available everywhere.

Extend public health coverage to areas lacking it, and develop plans for the care of the chronic invalid.

Expand our voluntary health insurance program, not only to cover more persons, but to cover those over age 65 and those suffering from illnesses of long duration.

See that the public is protected so that it can always obtain the services of physicians.

Revitalize our county health societies and make them leaders in their communities in all health matters.

Here is the positive answer to those who have attempted to delude the lay public into believing that the only solution to expanding and improved medical service, is socialized medicine. The fact is this country has seen greater progress in medical care under private medical initiative than any other major nation—and the medical fraternity is giving endless thought and concrete effort to making it still better. —*Clark County Clipper, February 19, 1953.*

Federal Health Assistance

Four New England Republican members are sponsoring measures in Congress providing federal aid to states to finance voluntary, prepaid health service plans.

The phrase "socialized medicine" seems to be staying on, though the New Deal has departed. But the term should not be used carelessly. Present legislation does not contemplate compulsory health insurance. It seeks to provide "adequate health care in a manner consistent with our country's traditions of freedom." It would offer "the maximum of assistance with a minimum of governmental interference."

Primary responsibility for development of adequate health services is placed on the states and local communities.

Whether you call it "socialized medicine" or not, federal funds are being used in increasing amounts for medical service. The senate labor committee in 1951 called the Veterans Administration medical care program one of the largest in the world. Because the V.A. cares for non-service connected cases, together with service-connected cases, the potential for growth is very great. . . .

It is the author's opinion that the most needed items for extension of health legislation are federal aid to medical education, integration of federal medical services and a program for cooperation between the federal medical establishment and local or regional health plans, whether voluntary or governmental. . . .

The legislation introduced by Senators Ives and Flanders and Representatives Javits and Hale is similar to that introduced in 1952. Some aid also is provided for training doctors and nurses, and for building diagnostic centers.

The new administration is opposed to compulsory health insurance but favors the principle of federal assistance to health programs. Hence, something constructive may come of the legislation this session.—*Kansas City Kansan, March 5, 1953.*

Cancer Conference Draws 300

Approximately 300 physicians attended the Fifth Annual Mid-West Cancer Conference held at Wichita, April 2 and 3, under the auspices of the Kansas Division of the American Cancer Society. Although most of the registrants were from Kansas, a check of attendance showed that physicians were also present from Oklahoma, Colorado, Nebraska, Illinois, and Missouri.

The scientific program followed the outline published in the March issue of the JOURNAL. The program for the banquet, however, was changed because of the illness of the scheduled speaker, Dr. Cornelius P. Rhodes of New York. A substitute speaker, who graciously accepted a late invitation, was Mr. Mefford Runyon of New York, executive vice president of the American Cancer Society.

Dr. Karl E. Voldeng, Wellington, who took office as president of the Kansas Division in March, presided at the banquet session. Dr. Voldeng is now filling the unexpired term of office of Dr. Charles H. Miller, Parsons, who resigned because of illness in his family.

Good public relations for the medical profession begins in the office of each individual physician.

PRESIDENT'S PAGE

Dear Doctor:

Tonight, just two weeks before I officially become your president, I am writing the first of those twelve pages that it seems your president is "entitled" to write. In trying to think what to say, my mind takes me back many years when, as one of a group of small boys, I stood stark naked on the ice-fringed banks of the Neosho River preparing to initiate the swimming season. We were half afraid to jump in, not only because of the shock of the icy water, but also because of the shock of the paddle, should our fathers get wind of our brave venture.

Just as then, I am now shivering at the thoughts of the responsibilities of the coming year. I can only hope that I may be as politic, as wise and as consistently a gentleman as those of your presidents who have preceded me. It has been my privilege, and a personal honor indeed, to have been closely associated with the past six presidents of our Society. To them I shall look for guidance and counsel.

During the past two months, your president, with the aid of Oliver Ebel and others, has spent considerable time and thought in selecting the committee chairmen and members for the coming year. The committee roster was published in the April issue of the JOURNAL. It was my hope that each committee could have its first meeting during the annual session.

Before action of the House of Delegates, I am unable to say some of the things that are uppermost in my mind. Future pages will cover some of those things in detail.

May I ask each and every one of you for your co-operation, counsel, and forbearance. May I thank you for this great honor that you have so generously given me. And may I have the forethought, the wisdom, and the ability to co-ordinate your work and ideas so that we all may make this another progressive year for the Kansas Medical Society.

EDITORIAL COMMENT

The 1953 Kansas Legislature

An exceptionally confusing session of the Kansas legislature was concluded during the first week in April. Side issues, particularly the work of a special investigating committee, produced a tone of unrest that permeated the entire session and undoubtedly influenced the legislative process. The effect of this condition was noticeable in many areas of activity and certainly created situations uncommon in past legislative sessions.

In the health field the final outcome was not substantially affected, except that some items of needed legislation were lost which might otherwise have carried. The following brief summary is a partial review of the most important health measures that were considered by the 1953 Kansas legislature.

During the November elections, the people voted an additional tax levy, outside the aggregate, for the purpose of operating mental hospitals. The Kansas legislature, empowered by the referendum, set up a small tax levy and created the position of director of institutions under the State Board of Social Welfare, whose responsibility it shall become to coordinate the programs of all mental hospitals in Kansas. This is the culmination of previous experimental legislation to improve the operation of these institutions. Now, for the first time, they will be operated as one service unit.

Another medical welfare problem concerned the establishment of a tuberculosis sanatorium for southeast Kansas. The Legislative Council, having studied the problem for the past three years, presented the legislature with a recommendation that such a hospital is necessary. There followed, during the early weeks of the session, a flurry of activity whereby numerous bills were introduced attempting to locate this hospital in various places within that territory. The resulting confusion almost defeated the entire project, and might have done so, had not all proponents finally agreed to a compromise and permitted all previous bills to be killed. Final action created a commission which is directed to establish a location within the nine southeast Kansas counties for the creation of a tuberculosis hospital.

Another welfare measure with medical interest is the adoption of a resolution directing the Legislative Council to conduct a two-year study on the problems of aging. This involves many areas such as employment, recreation, security, and also includes health. The Legislative Council is authorized to request the assistance of the Kansas Medical Society for consideration of that phase of the study.

Numerous public health measures were introduced. A request to construct a public health laboratory in Topeka was defeated, and the Legislative Council was directed to study this question. Defeated also was a uniform narcotics act. Several public health measures passed, of which two are of principal importance to the medical profession. A new law covering quarantine and the reporting of contagious diseases modernized the old statute to comply with present concepts of contagious diseases. The second was a pure food and drug act which empowers law enforcement agencies, including the Kansas State Board of Health for the first time, to impound adulterated food, drug, and cosmetic products.

Many associations had bills introduced revising their practice acts. Included were funeral directors, dentists, optometrists, and pharmacists. Most of these were successful, at least to a degree. The Kansas State Board of Medical Registration and Examination had introduced a bill raising the annual registration fee from the present $1.00 to a possible $5.00. This passed and will become law on July 1 of this year. That bill also made possible the increase of per diem expenses of the board and increased the secretary's salary. In general, this was about what was attempted by the other professional boards. There are some exceptions in that optometry requested additional judiciary power over its members and, with minor amendments, succeeded.

In the above category the bill having the stormiest experience was introduced by the Board of Pharmacy. Only a minor flurry was created in the House, but the Senate introduced and passed numerous amendments reducing the authority of this board. Unchanged were sections that increased the registration and license fees. The principal controversy came during the final days of the session with an amendment designed to give osteopaths the right to use drugs. Shortly before adjournment, this amendment was removed, and the pharmacy bill then passed without further dissent.

For some 20 odd years the osteopaths in Kansas have regularly attempted to set aside existing decisions of the courts by revising their practice act, and this session was an exception only because they tried to accomplish this in so many different ways. The osteopaths attempted first to create a composite board and thereby obtain the right to be examined and, if successful, to use drugs and to practice surgery. This was shortly replaced by a second proposal whereby the Board of Osteopathic Examiners would be authorized to issue two types of license, one to the osteopathic physician who would use drugs and practice minor surgery, and the other to the osteopathic physician and surgeon who would be licensed to perform major surgery. Identical bills on this subject were introduced in the House and in the Senate. Following

committee hearings, the House substituted the material for this bill and passed out of committee in its stead a short bill merely stating that osteopathic physicians should be given the right to use all drugs and chemicals in the practice of the osteopathic concept of treatment of disease. This bill was permitted to die on the calendar, and the Senate bill died in the committee. Following this action, the amendment to the pharmacy bill was introduced, and that ultimately became the object of considerable controversy before finally being disposed of as described above.

In the final hours of the session, a resolution was passed requesting the Kansas Medical Society and the Kansas Osteopathic Society to resolve their differences in the next two years, and making available to these associations the services of any state agency for this purpose.

The Doctor Draft

The present special doctor draft law expires on June 30, 1953. Senator Saltonstall, chairman of the Senate Armed Services Committee, and Senator Hunt introduced a bill on April 1 revising this act and extending it to July 1, 1955. At the time this is written, hearings have not yet been held, so provisions that will ultimately be contained cannot be predicted. Below, however, is a review of this legislation in the form in which it was introduced.

This bill retains the four existing priorities and leaves the order in which physicians are liable for service approximately as it was, with younger men in Group 3 going first and, when Group 4 is reached, declaring that those with least service are the first to be called. This new bill recognizes for service credit time spent in the armed services of other nations who fought on the side of the Allies. It retains 24 months as the required period of service, and the maximum induction age is kept at 51. A change of less general importance is that aliens are now made subject to service.

There are a number of important differences between the proposed new law and that which is currently in effect. One of these is the required length of service. As stated above, this is for 24 months except that physicians who have served 12 months or more since June 25, 1950, cannot be called again. Reserves who have served 12 months or more since September 16, 1940, but not in the period since June 25, 1950, could be required to serve not more than 17 months. This makes a preferential distinction for the doctor who has served in the Korean conflict.

Another difference is the liberalization of the commissioning procedure whereby appointment shall be made to such "grade or rank as may be commensurate with his professional education, experience, or ability." This is of importance because it specifically changes a section of the present act which declares that no person who has not held a previous commission receive a grade higher than major or lieutenant commander.

However, the $100 bonus is left out of the present act. There appears to be some feeling on this subject because a special five-man Defense Department commission examining military differential pay reports specifically against this practice. This commission recommends that those who genuinely volunteer for more than the required time should be given excess pay from the beginning of their active duty, but not a person serving only what is required of him. Just what this means is not clear at the moment, but there is no doubt that opposition has arisen to the continuation of the present practice. The A.M.A. Council on National Emergency Medical Service interprets it to mean the withholding of this additional benefit to all commissioned officers serving 24 months or less.

Other features include a clause providing that unless an officer was in the reserve prior to September 9, 1950, his commission would automatically terminate upon the completion of his active duty. As now written, no provision is made for the retention of this commission even if the physician should wish to remain in the reserves. And, finally, the National Advisory Committee, together with its state committees, is retained. According to the new bill, they will again be empowered to defer physicians in residency training programs.

All the above, of course, is tentative because the bill has not yet been discussed, nor has any action been taken on it. It is quite possible that considerable changes may be made even before this issue of the JOURNAL is distributed. So interested physicians are advised to watch for other announcements which may supersede this information.

Weight Reduction

A casual study of journals, newspapers, magazines, and pamphlets published in recent months indicates that weight reduction is one of the most popular subjects with today's readers. By referring to a number of such articles, the JOURNAL has compiled statistics and comments on several aspects of the matter.

Publications of the American Medical Association have carried numerous articles on the subject. One listed five D's as hazards to which obesity leads: disfigurement, discomfort, disability, disease, and death. The article mentions, however, five useful purposes of normal amounts of fat: (1) as a reservoir for food to be used in time of need; (2) as padding or shock absorbing material to protect organs against undue shock or vibration; (3) as a means of maintaining

warmth; (4) as providing for the normal contour of the body, as well as the smoothness and elasticity of the skin, and (5) as a conservation agent for protein.

Hundreds of persons can maintain normal weight easily. Others are too thin, a condition recognized as a health hazard for centuries. The remaining group is made up of those whose weight is excessive.

A recent Gallup poll reported by a popular news magazine indicates that 45 per cent of the women in the United States, and 25 per cent of the men, admit to excess poundage. The variation by sex, incidentally, was explained as being due to men's reluctance to "face the facts." From those figures it is estimated that the number of overweight persons in this country adds up to 34 million.

One of the big life insurance companies reports a smaller number of overweight persons, 25 million, and their statistics show that one of every three adults wants to lose weight. To help in this objective, the company has stepped up its program of education through movies, television, film slides, pamphlets, exhibits, and data for speeches and articles. The material is planned for four different groups, professional personnel, policyholders, voluntary health agencies, and the general public.

The company requested the co-operation of the Kansas State Board of Health and the Kansas Medical Society in making arrangements for showing a film, "Cheers for Chubby," in Kansas theaters. It was later reported that the film was shown in 50 per cent of our theaters on 1,225 separate programs to an estimated 226,000 persons.

Theories on the causes of overweight are multitudinous, but most professional opinion recognizes only one, excessive intake of calories. A doctor from this area, writing on fatness as a disease, presented interesting statistics.

"A pound of fat has about 4,100 calories," he said. "A calorie is the heat required to raise 15 drops of water one degree centigrade. There are 3 calories in a fourth teaspoon of sugar or a piece of butter the size of a lima bean. About 3 calories are lost climb-

SERVICE SEPARATIONS

As a service to physicians and communities in this state desiring additional medical personnel, the Journal of the Kansas Medical Society will publish in this column each month the names of medical officers who will shortly be separated from the armed forces. These are men who volunteered from Kansas, and many of them will probably be interested in finding locations in this state. Anyone interested in contacting these physicians may write to the address here given.

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ing a flight of stairs 10 feet high. An ounce of cream has 100 calories. In walking a mile, 100 calories may be lost. A good, fast walker can lose around 4,100 calories or a pound of fat walking 36 miles."

Public interest in calorie counting was demonstrated in this area recently. A newspaper which offered to send printed cards showing the caloric value of common foods to all who requested them was unable to keep up with the demand a day or so after the offer was made known. A feature story on reducing, "The Fat Boy Diet," which was continued from day to day, inspired many expressions of appreciation from the paper's readers.

The general public, often gullible, has tried a variety of reducing regimens, pills, vitamin supplements, slenderizing creams, laxatives, candies to be taken just before meals, one-food diets, "Hollywood diets," 7-day and 14-day diets of bizarre ingredients, and bath powders. The chairman of the Council on Physical Medicine and Rehabilitation of the A.M.A., Dr. Frank H. Krusen of Rochester, Minnesota, reported on such fads only to label them as unsuccessful. "The person who desires to reduce weight," he said, "must be reasonably intelligent, strongly motivated to reduce, have sufficient will power to remain on the low-calorie diet, and realize the importance of keeping his weight down."

The psychological angle has also been tried in weight reduction. In some cities reducers have banded together to give each other moral support. In Chicago, for instance, the Y.W.C.A. has three chapters meeting regularly with a psychiatrist. Still other meet for mutual aid as members of TOPS, Take Off Pounds Sensibly.

If it is true that misery loves company, Americans may find their problems less weighty by considering the avoirdupois troubles of others, especially in Great Britain. There the problem is especially complicated for physicians, who must attempt to please patients who want to reduce and at the same time keep in mind instructions from the ministry of health. A release from Kemsley News Service, London, is quoted.

"Slimming is costing Britain hundreds of thousands of pounds (sterling) a year because nearly 750,000 'slimmers' are doing it on the national health service.

"Most of the slimmers are women, and the ministry of health, having carried out a full-scale investigation, has sent a letter to 20,000 doctors. Tactfully worded, the letter suggests that 680 million dollars a year could be saved if the doctors prescribed one particular drug, instead of prescribing a proprietary brand. This drug alone had cost the country $1,120,000.

". . . The investigation showed that Britons are swallowing nearly 100 million slimming tablets a year, each person taking at least 300 in the minimum three-month course.

"Some medical men think the slimming craze is getting out of hand. Women are demanding tablets at a time when hospitals are having to economize on vital drugs to keep within their budgets."

ACTIVITIES OF MEMBERS

Dr. George I. Thacher, Waterville, observed his 50th anniversary in the practice of medicine last December. A postponed observance of the occasion was set for April 19, when the Chamber of Commerce of Waterville sponsored a celebration in Dr. Thacher's honor.

Dr. Franklin D. Murphy, chancellor of the University of Kansas, was guest of honor at a dinner given by the Atchison County K.U. Alumni Association at Atchison recently.

Dr. George J. Pierron, Olathe, announces that Dr. William E. McCann, who was recently released from service with the Navy, is now associated with him in practice. Dr. McCann was graduated from the University of Oklahoma School of Medicine in 1947.

Dr. H. W. Jury, who has completed 50 years of practice in Claflin, was presented a plaque of appreciation by the Claflin Lions Club at a recent meeting.

Dr. Irene Koeneke, Halstead, is one of three women appointed to represent Kansas on the National Board of Women's Medical College of Pennsylvania.

Dr. Carl M. Smith, Sedan, announces that Dr. George Hassard will be associated with him in practice after July 1. Dr. Hassard is now interning at Menorah Hospital, Kansas City, Missouri.

Dr. F. Wyatt Huston of Winchester was presented a citation of merit by Tarkio College, Tarkio, Missouri, at a ceremony held in March. The citation was for "outstanding achievements and service to others." Dr. Huston was graduated from Tarkio College in 1929 and from Rush Medical College in 1934.

Dr. R. Burnley White, Hanover, attended a refresher course at the University of Illinois Hospital in March. During his absence, Dr. R. H. Brownsberger, Kansas City, Missouri, cared for his practice.

Dr. John D. Huff, a graduate of the University of Kansas School of Medicine who recently completed his internship at Bethany Hospital, Kansas City, is now practicing in Argentine in association with Dr. Findley Law.

Dr. Doris A. Kubin and Dr. Charles E. Montgomery, both of Kansas City, recently enrolled for a four-week course of study on radioisotopes at the Oak Ridge Institute of Nuclear Studies, Oak Ridge, Tennessee.

Dr. W. W. Kridelbaugh, Arkansas City, was guest speaker at a recent meeting of Kansas and Oklahoma x-ray technicians. Dr. Warren S. Peiper, Arkansas City, was also a guest at the meeting.

Dr. James B. Pretz, who served in the Army Medical Corps during the past two years, was recently released from service and has resumed his practice in Kansas City.

Two health officers who were recently appointed are Dr. H. E. Haskins, Kingman, for Kingman County, and Dr. Donald E. McCoy, Oberlin, for Decatur County.

Dr. Archie B. McConnell, Burlington, spoke on rheumatism and rheumatic fever before the Burlington Rotary Club at a recent meeting.

Dr. W. Clarke Wescoe, dean of the University of Kansas School of Medicine, was recently appointed editor of the *Journal of Pharmacology and Experimental Therapeutics.*

Dr. Clarence J. Weber, new pathologist at Asbury and St. John's Hospitals in Salina, was the subject of a feature story in the *Salina Journal* in March.

The office and practice of the late Dr. Paul M. Krall, Kansas City, have been taken over by Dr. Charles Edward Gilliland. Dr. Gilliland has been practicing in St. Louis for the past 25 years and was on the staff of Washington University Medical School and Barnes Hospital there.

Dr. Alden Flanders, Hays, who was recently called to military service, resigned as consulting physician at Fort Hays State Teachers College before leaving. He was replaced in that position by Dr. Glen Hutchinson of the Eddy Clinic, Hays.

Dr. A. E. Beahm, Great Bend, has been named city and Barton County health officer to fill the unexpired term of Dr. Homer Russell who resigned from the posts.

Dr. H. M. Wiley, Garden City, was speaker at an all-county cancer meeting held at Dighton on March 12.

The Colt and Colt Clinic, Manhattan, announces that Dr. E. W. Christmann of Kansas City has joined its staff and is specializing in obstetrics and general practice. Dr. Christmann is a graduate of the University of Kansas School of Medicine.

Dr. O. W. Davidson, Kansas City, spoke on challenges and opportunities for civic clubs before a joint meeting of the Lawrence and Kansas City Kiwanis Clubs at Lawrence on March 5.

Dr. George M. Gray, dean of Kansas City physicians, was the subject of a feature story in the *Kansas City Kansan* on the occasion of his 97th birthday in March.

Dr. F. E. Wrightman, Sabetha, recently completed a course in cardiology and electrocardiography at the School of Medicine of the University of Michigan.

Dr. Warren W. Burns, formerly of the Nelson Clinic, Manhattan, has begun a course of training at the Norwich State Hospital, Norwich, Connecticut, while awaiting a call to active duty with the armed forces. He plans to specialize in psychiatry later.

Dr. F. A. Garvin, Augusta, was honored by the Order of Eastern Star in that city recently in recognition of his 50th anniversary as a member of the order.

Dr. D. B. McKee, Pittsburg, was guest speaker at the March meeting of the Crawford County Medical Assistants' Society. He spoke on the Kansas State Board of Health.

Dr. D. N. Medearis and Dr. Agnes Robbins, Kansas City, were recently named to the Technical Advisory Committee of the new Wyandotte County Child Guidance Center.

Dr. Karl A. Menninger and Dr. William C. Menninger, Topeka, were presented distinguished service awards in recognition of "a lifetime of service to the community and to the scientific world" by B'nai B'rith Lodge of Topeka last month.

Dr. J. H. A. Peck, St. Francis; Dr. John M. Porter, Concordia, and Dr. L. S. Nelson, Sr., Salina, took part in a program held at St. Francis in March to dedicate the new Cheyenne County Hospital.

Dr. Paul W. Schafer, chairman of the department of surgery at the University of Kansas School of Medicine, presented the annual lecture at the meeting of the Nashville Surgical Society at Vanderbilt University on March 13. His subject was "The Use of Plastic Materials in Reconstructive Surgery of the Chest Wall and Diaphragm."

A feature story in the *Cherryvale Republican* on March 27 paid tribute to Dr. William G. Norman, who has practiced in Cherryvale for 46 years.

Dr. Donald L. Rose, chairman of the department of physical medicine at the University of Kansas School of Medicine, presented papers at two meetings recently. On March 26 he spoke on "Painful Low Back" before the Cleveland Society of Physical Medicine and Rehabilitation, and on April 27 he discussed "Electrodiagnosis" before a meeting of the Missouri Chapter of the American Physical Therapy Association.

Dr. Albert E. Bair, who was recently released from service with the Air Force, has reopened his office for general practice in Independence. During his last 18 months of military service, Dr. Bair was stationed at Weisbaden, Germany.

Dr. John B. Jarrott, Hutchinson, announces the move of his office to a new location and his future association in practice with Dr. E. B. Struxness, who is soon to be released from military service.

Dr. Stanley R. Friesen and Dr. David W. Robinson, of the University of Kansas Medical Center, were recently elected to membership in the Central Surgical Society.

A committee composed of Dr. Earl L. Mills, Wichita, and Dr. Lee H. Leger and Dr. Mahlon H. Delp, Kansas City, arranged the scientific program for a regional meeting of the American College of Physicians held in Kansas City on March 20. Among those who took part in the program were: Dr. Henry S. Dreher, Jr., Salina; Dr. T. K. Lin, Kansas City; Dr. John L. Morgan, Emporia; Dr. Benjamin Metassarin, Wichita; Dr. Max S. Allen, Kansas City; Dr. John E. Crary, Topeka; Dr. Robert Bolinger, Kansas City; Dr. Robert A. Jordan, Lawrence, and Dr. Robert W. Weber, Kansas City.

Dr. Thomas G. Orr, Jr., instructor in surgery at the University of Kansas School of Medicine, read a paper, "Evaluation of the Maes Technique for Leg Amputation," at a recent meeting of the Southeastern Surgical Congress in Louisville, Kentucky.

COUNTY SOCIETIES

The March meeting of the Harvey County Medical Society was held at the Ripley Hotel, Newton, on March 2. A team from the Kansas Academy of General Practice were guests. Dr. James H. Enns, Newton, presented a paper, "The Accommodative Element of Estropia." At the business session Dr. R. C. McClymonds of Walton and Dr. H. G. Schaumloffel of Burrton were elected to honorary membership.

A later meeting was held on April 6. Dr. W. C. Dreese, Halstead, gave an illustrated paper on "Chronic Thyroiditis."

Members of the Geary County Society were hosts to the Golden Belt Medical Society at a meeting held April 9 at the Bartell Hotel, Junction City. Dr. Alfred Uihlein of the Mayo Clinic spoke on "Hydrocephalus and Spina Bifida," and Dr. C. J. Weber, Salina pathologist, discussed "Potassium Deficiency." Dinner was served after the program, and a business session followed.

Members of the McPherson County Society and Auxiliary entertained doctors and their wives from Harvey and Marion counties at a meeting on March 19. Dr. Carl Zacharias, an immigrant physician living in McPherson and interning at St. Francis Hospital, Wichita, spoke on "Present Day Medical Practice in Germany." Mrs. Zacharias presented an original puppet show.

Dr. Lafe Bauer was elected president of the Smith County Society at a meeting held at Smith Center recently. Dr. R. G. Sheppard was named vice-president, and Dr. Victor E. Watts was re-elected secretary. Dr. Buford Hartman will be delegate to the state meeting.

Members of the Shawnee County Society and their wives were guests of the Shawnee County Medical Assistants' Society at a party held at the Hotel Kansan, Topeka, on March 30. Mrs. May J. McGuire, Kansas City, spoke on "Famous Men."

The Southeast Kansas Medical Society met at the Booth Hotel in Independence recently with members of the Auxiliary as guests. Two speakers from the University of Kansas Medical Center presented the scientific program. Dr. Charles C. Herbert, assistant professor of medicine, spoke on "Differential Diagnostic Points in Chest Diseases." Dr. Paul R. Schloerb, assistant professor of surgery, discussed "Postoperative Care."

A recent meeting of the Wyandotte County Society was devoted to a film and discussion on glaucoma. Dr. James E. Bresette served as moderator.

Physicians from Miami, Franklin, and Anderson counties were present at a recent meeting of the Miami County Society. Dr. Harry Wahl, Kansas City, spoke on "Pathology in the Aging Process."

A joint meeting of the medical societies and auxiliaries of Brown, Doniphan, Jackson, Marshall, and Pottawatomie counties was held in Seneca on April 28. Dr. W. Clarke Wescoe, dean of the University of Kansas School of Medicine, was speaker.

Members of the Shawnee County Society held a dinner meeting at their new office building on April 13. Dr. John Adriani, New Orleans, spoke on "Newer Items of Anesthesia of Interest to Non-Anesthetists." Mr. Oliver E. Ebel, executive secretary of the Kansas Medical Society, discussed activities of the state organization.

DEATH NOTICES

Harold Ross Fields, M.D.

Dr. H. R. Fields, 35, only physician in Johnson, died March 20 as the result of injuries suffered the day before when the wall of a building being razed collapsed on him. He had practiced in Johnson for more than four years and was on the staff of the hospital at Ulysses, where he died. He was an active member of the Finney County Medical Society. Dr. Fields was graduated from the University of Kansas School of Medicine in 1945 and served in the Navy on the *U.S.S. Wisconsin* during World War II.

Middleton Lee Perry, M.D.

Dr. M. L. Perry, Topeka, who served as president of the Kansas Medical Society in 1922-1923, died at the home of his son in Kansas City on April 10. He was 84 years old. He had been superintendent of the Topeka State Hospital for 30 years, retiring from that post in 1948. Prior to that, he had been superintendent at the State Hospital for Epileptics in Parsons for 15 years. He was a graduate of the Universiy of Tennessee College of Medicine, class of 1892, and had done postgraduate work at the University of Virginia, the University of Berlin and the University of Vienna. Dr. Perry was a member of the American Psychiatric Association and of the Central Neuropsychiatric Association.

Charles Wesley Beasley, M.D.

Dr. C. W. Beasley, 82, who had practiced medicine for 59 years, died April 7 at his home in Lyndon. He had practiced there since 1901, and became inactive early this year. In 1950 he and Mrs. Beasley, on the occasion of their golden wedding anniversary, were honored by the community and were presented a car and other gifts of appreciation for his services. Dr. Beasley was a graduate of Missouri Medical College, St. Louis, with the class of 1894. He was an honorary member of the Osage County Medical Society.

Tumor Conference*

Brain Tumors

Edited by H. I. Firminger, M.D., and F. R. Skelton, M.D.**

Dr. Helwig: These two cases of brain tumors will serve to emphasize the well known statement of Foster Kennedy. In the introduction to Dr. Bailey's book on intracranial tumors,[1] Kennedy is quoted as follows: "Who cares for patients with brain tumor must bring to his problem much thought and stout action. There is need also of a formidable optimism, for the dice of the gods are loaded."

CASE NO. 52-109

Dr. Williamson: M. T. was a 5-year-old white boy, one of 12 children. He had not been injured or ill until last June, when he had two episodes of fever and vomiting, followed by recovery. Four weeks before admission, his mother first noticed that he staggered when he walked; he seemed to fall to either side. There had been a little fluctuation in the staggering, but on the whole it had become progressively worse. He had complained of headache on one or two occasions and, on one occasion before he came in, had vomited without warning. There were no other neurological symptoms.

On examination, the boy walked with a typical cerebellar gait; that is, with a wide base in order to keep his balance. He had difficulty in keeping his trunk in line with the vertical plane. He could not walk heel-to-toe without falling and tended to fall equally to either side. In the Romberg position he fell even with his eyes open. He had bilateral papilledema and nystagmus on right and left lateral gaze which was worse to the right. There was a "cracked-pot" sound on percussion of the skull, indicating that his cranial sutures were separated. He had remarkably good ability to do the finger-to-nose test on each side, and good ability to do the heel-to-knee test, so his ataxia was mainly truncal.

Roentgenograms of the skull confirmed the separation of the sutures. An electroencephalogram was normal. A ventriculogram was done by thrusting the spinal needle through the separated sutures. One hundred ten cubic centimeters of fluid under increased pressure was removed and replaced with air. Films revealed marked internal hydrocephalus with considerable elevation of the floor of the fourth ventricle and a tumor projecting into the lower end of the dilated fourth ventricle. A suboccipital craniotomy was done, with removal of most of the tumor. His postoperative course has been satisfactory. He is now receiving x-ray therapy.

Dr. Tice: These films show everything Dr. Williamson described. The coronal, lambdoid, and sagittal sutures are widely separated. We did not see the hammered-brass appearance of the skull, considered so characteristic of prolonged increased intracranial pressure, especially in adults. The fourth ventricle is elevated, and there is marked dilatation of the lateral ventricles, third ventricle, and anterior horns (Figure 1). We felt there was something obstructing the fourth ventricle in the posterior fossa. In a child of this age a medulloblastoma is, I think, the logical diagnosis.

Figure 1. Roentgenogram of the skull showing the separation of sutures, the marked dilatation of the ventricles, and the elevation of the floor of the fourth ventricle.

Dr. Boley: Microscopically the tumor is mostly within the meninges. The greater part of the tumor has a uniform appearance and is composed of sheets of cells that vary little in size. The tumor cells are larger than lymphocytes, usually are elongated and oval, and the greater number are hyperchromatic. The cells show indistinct cytoplasmic borders and tend to run together as in sarcoma. Some mitotic figures are seen. The Masson stain for connective tissue shows that the tumor cells are not producing fibrous tissue, but the tumor has infiltrated around the meningeal blood vessels in pre-existing meningeal

* Cancer teaching activities aided by a grant from the National Cancer Institute and the Kansas Division of the American Cancer Society.

** Trainee of the National Cancer Institute.

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SEARLE Research in the Service of Medicine

stroma. About the only thing that is characteristic of this tumor is the uniform hyperchromatic cells and the occasional tendency toward pseudo-rosette formation. If one were given this slide without any history, it would be difficult to decide whether it was a medulloblastoma or a neuroblastoma of the adrenal. With the benefit of the history, it seems clearly to be a medulloblastoma.

Dr. Williamson: This was the classical clinical picture of medulloblastoma. In the first place, he had the picture of cerebellar tumor, and his main symptom was that of unsteadiness in gait, associated with headache and vomiting. Secondly, it was obviously tumor because it had produced increased pressure which could be clinically verified by two signs: one, the "cracked-pot" sound of skull percussion, and the other the papilledema observed on ophthalmoscopic examination. The only question remaining was the type of cerebellar tumor.

Fundamentally, most of the cerebellar tumors in childhood are one of two types: astrocytoma or medulloblastoma. Most often we can tell preoperatively which it is. The astrocytoma, being a benign tumor and being one which is usually out in a hemisphere, has a longer history and is more likely to have unilateral signs. The medulloblastoma, being highly malignant and arising in the midline and presenting into the fourth ventricle, has a short history because it blocks the fourth ventricular aqueduct early and produces high intracranial pressure. As a result, the cerebellar signs are equal on examination—you can't choose between the right and left sides. This boy had truncal ataxia, with no ataxia of his extremities. Clinically, we felt that it was a malignant midline tumor. At surgery, the tumor was the size of a hen's egg and filled a greatly dilated fourth ventricle, but was removed without any technical problem. However, it could be seen infiltrating into the edges of the cerebellum bilaterally.

Why, then, did we operate on him if we knew it was a medulloblastoma which could not be completely removed surgically? The main reason for operating is that one can never be sure of the tumor type until he removes a piece and the pathologist examines it. Medulloblastoma is one tumor that responds beautifully to x-ray, it just melts down; but it's disastrous to treat a benign cerebellar astrocytoma with x-ray because it doesn't respond. It would be most regrettable to let the child go blind with papilledema and die, only to find a benign curable tumor. Roughly, 50 per cent of the tumors in these cases are astrocytomas and 50 per cent medulloblastomas; so, with a one-month history and a midline picture, we felt this child had a medulloblastoma, but surgery was done for verification.

Once we had verified it, we tried to remove enough of the tumor to relieve the block. We removed all of the tumor from the fourth ventricle, which relieved the hydrocephalus and made the patient clinically almost well. We then turned him over to Dr. Tice for x-ray therapy, and he should get completely well clinically. Three months from now you won't find a sign in this boy. He will stay well one to two years and then die of recurrence. You may ask why we can't operate on the recurrence. It is because this particular tumor seeds in the subarachnoid space, and recurrences very commonly are not in the posterior fossa. These patients come in with paraplegia, from seeding down the spinal canal, or they may have involvement of a frontal lobe, or maybe they will have aphasia or focal fits; and when they come to autopsy they have widespread scattered recurrences throughout the brain, the spinal canal, and the subarachnoid space.

There are two other cerebellar tumors that occur in childhood, although much less commonly. One is ependymoma of the fourth ventricle, which is about halfway between malignant and benign but relatively benign. Unfortunately, one can't totally remove it because it arises from the ependyma of the floor of the fourth ventricle, and we can't very well take that out and have anything worthwhile left. The other is hemangioblastoma of the cerebellum. Characteristically we see such tumors in adults, but occasionally we see it in a child. We can be suspicious of it if there is a vascular hemangioma of the skin somewhere or if there is a family history of such tumors; it is the one brain tumor that runs in families.[2]

Dr. Helwig: I think it should be emphasized that medulloblastoma is one of the rare tumors of the nervous system, generally speaking, that does respond as if by magic to irradiation. I have one case in my own material that survived 11 years before she seeded clear down to the cauda equina. This tumor used to be alluded to as diffuse multicentric sarcomatosis of the meninges until Bailey and Cushing[3] brought it into focus as a separate and distinct entity. Five years, I believe, is not too long to expect some regressions to last. I'd like to have you discuss your therapeutic management of these, Dr. Tice, if you will.

Dr. Tice: Our radiation is planned to crossfire the posterior fossa. We treat through the occipital portal, each lateral and vertical portal, using about an 8 or 10 x 10 portal. We strive to deliver approximately 4,000 r tumor dose or perhaps a little more. At the same time, because the tumor does seed up and down, we systematically treat the canal from the cervical spine down to the coccyx, giving a dose of around 2,500 or 3,000 r. One series that I recall reported 19 months average survival of the cases.[4] Years ago we checked our cases. We didn't have very many, but I think ours was about 21 months average survival.

50 and Six

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CASE NO. 52-110

Dr. Brackett: L. S. was a 42-year-old man. About 3 months before admission, while sitting at a counter, he had a sudden episode of extreme weakness which involved his right arm and leg. He turned around and grasped the counter, and almost before he realized what was happening the symptoms had disappeared. He remained fairly well until approximately 3 weeks before admission, when he had a progressive and insidious onset of weakness of the right arm and leg. In addition to this, he had some difficulty with sensation in the right side. He said he had had episodes of numbness involving the right arm for as long as 10 years before admission; the significance of this was not clear. Examination showed a very slight degree of papilledema. He walked with a shuffling gait and had an obvious right hemiparesis. He had slight hyperreflexia on the right side, with absent abdominal reflexes on the right. He also had astereognosis on the right. An arteriogram and an electroencephalogram were normal. Dr. Tice, will you describe the ventriculograms?

Dr. Tice: There was no dilatation of the ventricles. The lateral ventricles, which should form a smooth curve running posteriorly, were depressed downward. In addition, there was right lateral displacement. We felt that there was a mass in the parietal lobe on the left side.

Dr. Brackett: Clinically this patient had all the findings of left parietal lobe tumor, and we considered two possibilities. If this history of intermittent numbness of the right arm of 10 years' duration were real, there was always the possibility that we were dealing with a parasagittal meningioma. If, however, it were not real and had no connection with his present problem, then the 3-weeks history indicated a rapidly growing tumor. From the ventriculogram, we were surprised to see that this ventricular deformity which Dr. Tice has demonstrated was present in both lateral ventricles and, actually, appeared more marked in the right lateral ventricle than on the left. This strongly suggested the possibility that this tumor arose in the corpus callosum and was growing bilaterally into both cerebral hemispheres. However, without operation it was impossible to exclude the possibility that this patient had a dumbbell parasagittal meningioma arising from the falx.

Therefore, a flap was turned up in the region of his left parietal lobe. The surface of the brain was tense and bulged under a great deal of pressure, and it was necessary to make a transcortical incision in the left parietal area. At a great depth, and farther anterior than we had anticipated, we encountered a glioblastoma. Wisely or unwisely, because we were faced with a bulging brain, I decided to make a separate incision well anterior to the anterior margin of the flap and try to remove enough tumor to effect decompression. This was not successful, and we were forced to sacrifice the bone flap. After operation, the patient's hemiparesis was converted to a hemiplegia, and he was considered an operative failure. He was discharged to go home approximately a week after operation.

In general, these glioblastomas are not sensitive to x-ray therapy. My personal policy, and this will vary considerably, has been this: if a partial removal has been carried out, then the patient is given x-ray therapy. If it has been impossible to carry out any type of surgical removal, then I don't believe that x-ray therapy is indicated. The one indication for surgery in malignant gliomas of this type is to relieve suffering from pressure. When the tumor is located in a lobe which can be readily removed, such as the left or right frontal lobe or a temporal lobe, one can remove the lobe and relieve the patient's main symptoms due to pressure. It will give the patient a number of months and in a few cases a year or two of useful life before he finally succumbs to his tumor.

Dr. Helwig: Thank you. Dr. Boley, will you tell us about the biopsy on this case?

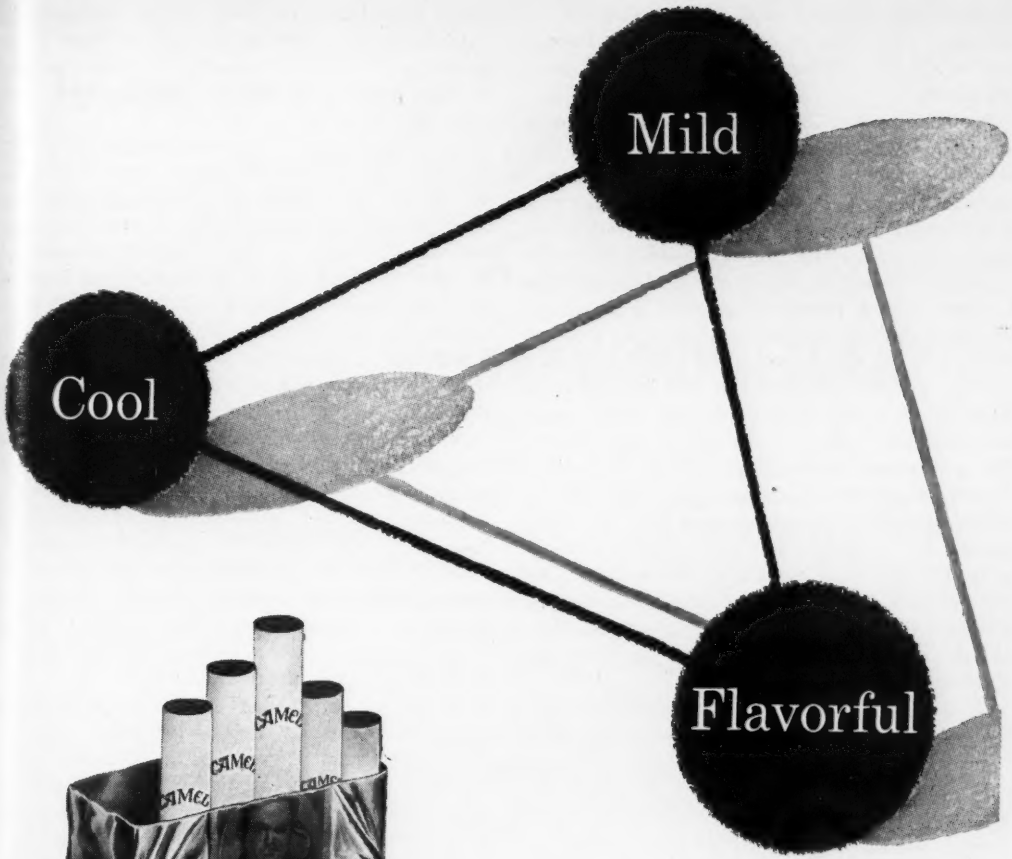
Dr. Boley: The tumor was quite cellular, with areas of necrosis and a few areas of hemorrhage suggestive of rapid growth. There is a great deal of variation in the cells; specifically, there are giant cells, often with multiple nuclei. There are numerous astrocytes, and in areas immature cells predominate. The microscopic findings are those of glioblastoma multiforme.

Dr. Helwig: Dr. Stoddard, would you comment further on the microscopic features of this tumor?

Dr. Stoddard: It might be worth pointing out that gliomas often are variable in their morphology from area to area, and classifications of gliomas based on biopsy fragments or one-section sampling must be accepted with reservation. One has to sample these tumors widely; and, when you do, many cases do not fit the rather arbitrary classifications that have been set up for brain tumors.

Dr. Helwig: If one encounters a rapidly growing infiltrative astrocytoma or astroblastoma, the outlook is just as grave as it is for glioblastoma multiforme, so if such a tumor shows sufficient variation in nuclear form, even though it be of astrocytic background, you can't hope to cure it. Therefore, it really doesn't make a great deal of difference as to the diagnosis of these two tumors.

Some new methods have been devised within the last few years for localization of these tumors by the use of ultrasonics, fluorescein and radioactive isotopes such as P^{32}. One treatment consists of giving intra-



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venous boron and lowering the patient into a crypt in an atomic pile and bombarding him with uranium^{235}, thus making the boron set up a chain reaction. I would like to ask Dr. Williamson to comment on those procedures.

Dr. Williamson: The basis on which radioactive isotopes have been used for localizing tumors was first brought out by the Minnesota group, Moore and Peyton,[5] who were working with fluorescein, trying to get tumors to fluoresce. They came out with a very practical procedure that we have used occasionally. If intravenous sodium fluorescein is administered to a patient an hour before a craniotomy is performed, the fluorescein will concentrate in the tumor 10, 12 or 15 times higher than in normal brain. It subsequently has been proved that it is due to the abnormal capillaries of the tumor. Fluorescein will seep through these capillaries, where it does not seep through capillaries of normal brain. At operation, if one puts the tumor or biopsy tissue from the tumor under a Wood's ultraviolet light, it fluoresces because of its fluorescein content. So, for a while they were advocating, instead of sending the needle biopsy specimen to the pathologist, that one place the tissue under a Wood's light and see if it glowed. If it glowed, it was tumor. After all, that's the main thing we want to know in a needle biopsy.

Then they tried tagging the fluorescein with radioactive iodine to make diiodofluorescein. This group has continued to use radioactive diiodofluorescein, giving it intravenously, then going over the head with a Geiger counter. Using radioactive localization, Loyal Davis[6] and his group in Chicago have reported 300 cases in which they succeeded in localizing 95 per cent of tumors, with very few errors on the right and wrong side.

The group in Minnesota is a little more conservative, and they now report that if they use the clinical picture of the case to correlate with their interpreting the radioactive isotope localization, they can be about 75 to 80 per cent accurate.[7]

LeCocq says, however, that it has to be correlated with the pathological tissue. A cystic tumor, for instance, won't concentrate any dye in the cyst. The very vascular tumors concentrate much more dye than the avascular ones. A brain abscess or subdural hematoma will concentrate dye anywhere there are abnormal capillaries. Now most investigators are using iodinated serum albumin, because it stays in the body a long time and you can test today and recheck tomorrow. With radioactive iodine, it's excreted so rapidly and picked up by the thyroid, that you can test patients only for 2½ hours.

We set up a counter here and started using this technic, and we found it rather impractical because it takes about 3 hours to run a test. Furthermore, it takes a skilled person running the tests all the time to perfect the technic to the point where he can probably diagnose approximately 75 per cent of them as to the site, and whether it's tumor or not. Unless we can do much better than that, in a shorter time, it is rather impractical for us.

So far as ultrasonics are concerned, I heard Dr. French,[8] with the Minnesota group, when he gave his first paper on using supersonic sound to try to localize brain tumors. They started off the easy way: on brains with known tumors in them, removed at autopsy, beaming supersonic sound and catching the rebound in radar fashion on return of the impulse. They weren't getting anywhere with that. I talked to Dr. French one year after that first paper, and they still weren't getting anywhere. I've heard no recent papers at all.

As to treatment with the radioactive isotopes, no isotope concentrates enough in the tumor to make it practical for treatment; that's been tried very thoroughly and very carefully. Just recently in New York at a symposium on the treatment of malignant tumors,[9] everyone agreed that there was not enough concentration of any presently known dye or chemical to carry a radioactive isotope into a tumor to render a useful dosage without getting much too high a concentration in the brain itself.

Dr. Helwig: In closing, I think it should be emphasized that in contrast to these two cases there is a rather large group of tumors of the brain with a very favorable outlook; in fact, probably 55 to 60 per cent of brain tumors do have a favorable outlook, such as cystic astrocytomas, certain sharply circumscribed oligodendrogliomas, pituitary adenomas, some Rathke pouch cysts, some pinealomas, some ependymomas, some cystic hemangiomas, and a fair percentage of meningiomas. So don't get the impression from these cases, which were doomed at the outset, that brain surgery hasn't come a long way, and that there aren't many favorable tumors that can be attacked successfully.

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ANNOUNCEMENTS

The Department of Otolaryngology, University of Illinois College of Medicine, announces its annual assembly in otolaryngology. The basic section, September 21 through September 26, will be devoted to surgical anatomy and cadaver dissection of the head and neck, and histopathology of the ear, nose, and throat. The clinical section, September 28 through October 3, will consist of lectures and panel discussions, with group participation in otolaryngological problems and current trends in medical and surgical management.

Registration will be limited. Information may be secured from the Department, University of Illinois College of Medicine, 1853 West Polk Street, Chicago 12, Illinois.

The Fifth Annual Course in Postgraduate Gastroenterology, sponsored by the National Gastroenterological Association, will be given at the Hotel Biltmore, Los Angeles, October 15, 16, and 17. Dr. Owen H. Wangensteen, professor of surgery at the University of Minnesota Medical School, and Dr. I. Snapper, director of medical education, Cook County Hospital, Chicago, will be co-chairmen. One complete session will be devoted to a clinic at the College of Medical Evangelists at Loma Linda.

Complete information may be secured from Department GSJ of the Association, 1819 Broadway, New York 23, New York.

The Schering Corporation, Bloomfield, New Jersey, has announced its eighth annual competition for medical students. Three $500 prizes will be awarded the students whose essays are judged winners on the subject of (1) antihistaminic treatment of upper respiratory allergies and infections; (2) hormone therapy of the degenerative diseases, or (3) new concepts in the treatment of peptic ulcer. Essays are to be no longer than 5,000 words. The deadline for submitting entry forms is July 1, 1953, although manuscripts may be received as late as October 1.

More than 25,000,000 people are now enrolled in Blue Shield plans, according to Frank E. Smith, director of the national Blue Shield organization. This constitutes 16 per cent of the entire population. A total of $208,000,000 was paid in benefits during 1952, which was 80 per cent of the plans' income. The national average expense of operation was brought down to a new low of 12 per cent.

Opinions of Medical Officers

An interesting analysis of 467 questionnaires returned by former armed forces medical officers was recently released by the Council on National Emergency Medical Service of the A.M.A. The physicians supplied information on percentage of time spent in treatment of military personnel and their dependents, staffing conditions, and their willingness to remain in service.

They reported that between 44 and 54 per cent of their total overseas time was spent in treatment of military personnel. In service in this country the percentage varied from 39 to 53. Treatment of dependents took between 19 and 28 per cent of overseas time and between 25 and 44 per cent of domestic time.

The following figures illustrate opinions on staffing conditions: overstaffing, 136 replies, 15 to 44 per cent; understaffing, 79 replies, 15 to 28 per cent; adequate, 227 replies, 42 to 58 per cent.

Two hundred fourteen stated that they were willing to stay in service; 236 indicated that they did not wish further military duty.

Further information on the subject will be compiled by the Council as replies are received from physicians returning to civilian life.

Symposium on Chest Disease

A symposium on diseases of the chest will be held at the State Sanatorium for Tuberculosis, Norton, on Sunday, June 14, under the auspices of the Northwest Kansas Medical Society. Dr. Carl Temple, Fitzsimons General Hospital, will conduct the symposium. As a special feature Mr. Olaf Soward, Topeka, will speak on "What the Public Thinks of the Medical Profession." Complete information on the program may be secured from Dr. C. F. Taylor, at the sanatorium, Norton. The program will begin in the afternoon at 1:30 o'clock.

Research Grant to K.U.

A two-year grant of $8,316 has been awarded the University of Kansas School of Medicine for research in circulatory system disease by the Life Insurance Medical Research Fund. Dr. Kenneth E. Jochim, assistant dean of the school and chairman of the department of physiology, will direct the study.

Notify the Executive Office of all changes of address. This will assure prompt delivery of all correspondence from the Kansas Medical Society. The Society's new address is 315 West Fourth Street, Topeka, Kansas.

Meat...

and the Low Sodium Diet

The beneficial effect of sodium restriction in the management of hypertension and many types of cardiac disease is firmly established. A low sodium diet aids in preventing edema and frequently leads to a significant reduction in arterial tension.

To emphasize the importance of sodium restriction and to enable the physician to present his patient with an informative discussion of the subject, The American Heart Association has just published a valuable pamphlet entitled "Food For Your Heart."* Covered also in this booklet is the importance of weight reduction in the management of the cardiac patient.

Dietary recommendations for three levels of sodium restriction are given. In all of them, meat is an important constituent of the diet. In the diet providing moderate sodium restriction (0.5 to 1.5 Gm. of sodium), 4 to 6 ounces of unsalted meat, fish or fowl are allowed. In severe restriction (0.5 Gm. sodium), 3 to 4 ounces of meat are permitted daily. The weight reduction-moderate sodium restriction diet calls for 5 to 6 ounces of meat daily.

This booklet again emphasizes the valuable application of meat in the dietary management of cardiac disease, hypertension, and obesity. Since, as the manual emphasizes, infectious diseases and such scourges as typhoid fever have now been controlled with antibiotics, chemotherapeutic agents and modern sanitation, "many physicians and scientists consider nutrition the most important environmental factor in health."

Meat, with its wealth of high quality protein, B complex vitamins and important minerals, plays an important role in the aim toward better national health. That the generous consumption of meat by the American people is a significant factor in attaining this goal is reflected in the statement that "most physicians feel that the high American consumption of protein is a good thing."

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*Food for Your Heart, a Manual for Patient and Physician, Department of Nutrition, Harvard School of Public Health, Harvard University, The American Heart Association, Inc., New York, 1952. Copies available through local Heart Association.

The Seal of Acceptance denotes that the nutritional statements made in this advertisement are acceptable to the Council on Foods and Nutrition of the American Medical Association.

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Systolic Murmurs*

Henry H. Reed, Senior Student
University of Kansas School of Medicine

In 1816 Laennec devised the stethoscope. Now, more than 130 years later, there still exists a great deal of confusion about the significance of many systolic murmurs. This does not detract from the value of auscultation, but rather presents an additional challenge to analyze correctly the significance of physical observations.[1] The physician is frequently called upon to prescribe management for patients with systolic murmurs. The physician must also determine the acceptability of patients with systolic murmurs for insurance, athletics, and military service.

The art of diagnosis must always depend in large part on the observations, the care, the skill, intelligence, and reasoning power of the individual examiner. Thayer[2] feels that to be a competent and intelligent diagnostician one must be capable of exercising reason on the basis of simple anatomical, physical, and physiological considerations. Statistics are not the basis for competent diagnosis. Work correlating clinical findings with postmortem examinations, while yielding a wealth of information, leaves much unanswered. The dynamics of circulation, pressure changes, velocity of blood, etc., cannot be adequately studied with necropsy material.

Regarding the mechanism of a murmur, it is currently thought that murmurs and thrills are produced by the stream of blood passing from an area of relatively narrow caliber into a larger chamber, or by passing through a constricted area in a tube. This condition is easily duplicated experimentally. The resultant vibrations set up in the valves and walls of the heart chambers and of the great vessels cause the actual murmur. Fahr[3] felt that every tube has a "critical velocity," above which turbulence is produced without the blood passing into the "larger" chamber.

Some anomalous conditions, such as a torn valve or a streamer of tissue, may also cause a murmur. Contrary to the belief of many, roughening of the valve and vessel surfaces probably does not cause a murmur, nor does a gradual increase of the vessel caliber. The change must be abrupt.

The heart, with its aortic and pulmonic rings of relatively constant circumference, connects the powerfully ejecting ventricles to the elastic and easily dilatable distal vessels. Why then do we not always have aortic and pulmonic systolic murmurs? The only answer proposed is that nature has so admirably adjusted ventricle, ring, and vessel that in normal function they act as if they are parts of one elastic tube of constant size.

The velocity with which the stream moves is the principal factor responsible for the intensity of the sound. The intensity, when heard by the auscultator, is influenced by the extent and character of the media through which the sound must pass before reaching the examiner's ear. The characteristic transmission areas of the various murmurs must be considered in relation to the intensity of the murmur.

In 1933 Levine,[4] in an effort to produce more clarity in the discussion of murmurs, recommended the use of a grading scale. This scale is a gradation of intensity only and, as currently advised by him, is as follows:[5]

Grade i—Faintest that can be distinctly heard. Unlikely to be audible during the first few seconds of auscultation.

Grade ii—A slight murmur heard immediately.

Grade vi—Very loud, may be heard with the stethoscope slightly removed from the chest wall.

Grade v—Loudest murmur still inaudible with the stethoscope removed from the chest wall.

Grades iii and iv are intermediate.

Levine further states that it has not appeared to be possible, with the present state of our knowledge, to draw any diagnostic conclusions from the fact that one murmur is "musical" or that another is "harsh" or a third is "whistling." This opinion is not generally accepted. Murmurs should be graded as to exact timing, duration, location, and transmission, as well as to intensity. The position of the patient must also be considered.

In 1942 Adams, Craib, and White[6] made another step toward helping to clear some of the confusion of terminology. They advocated discarding the terms "functional" and "organic" for the more significant clinical terms "physiological" and "pathological."

Their classification is as follows:

I. Physiological murmurs.
   A. Intracardiac or intravascular.
   B. Extracardiac.
      (a.) Cardiopulmonary.
      (b.) Pericardial.

II. Pathological murmurs.
   A. Due to structural valvular disease.

* This is one of 11 senior theses selected for publication by the Editorial Board from a group of 15 judged the best by the faculty of the University of Kansas School of Medicine.

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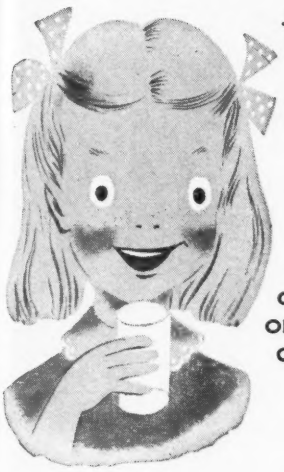

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B. Due to congenital cardiovascular defects.
C. Due to dilatation of ventricle, aorta, or pulmonary artery from (1) cardiovascular disease, or (2) other disease such as anemia, thyrotoxicosis, or severe infection.
D. Due to pericarditis.

The use of such nomenclature as functional, accidental, hemic, accessory, adventitious, atonic, and nonorganic is considered poor.

With these tools let us approach the murmurs found during systole at the various areas of auscultation.

APICAL SYSTOLIC MURMURS

In mitral insufficiency, the valve is a point of constriction in the course of regurgitated blood. This murmur is usually a blowing, high pitched type of murmur beginning with or immediately after the first heart sound. It is interesting to note that experimental work on dogs revealed that this murmur heard directly over the atrium is harsh and rasping. However, when heard over the left ventricle as in human auscultation, it assumes a blowing character and the thrill is often lost.[2] Length and intensity vary with the extent of incompetency. This type of murmur is due to:

(a) A pathologic or physiologic extracardiac condition which causes a temporary or permanent dilatation of the heart.

(b) Organic disease of the heart with dilatation and no valve deformity.

(c) Regurgitation due to a mitral valve deformity, usually of rheumatic origin.

Murmurs may be transmitted to the apex from the base or substernally. This may occur in aortic stenosis, pulmonic stenosis, or interventricular septal defect. These murmurs can usually be distinguished from those of mitral origin since the extra mitral murmurs are generally heard louder at some other area. Another diagnostic aid in localizing the source of the murmur in the mitral valve is that the murmur is well heard in the lung bases, but is poorly heard at the base of the heart or in the neck. The aortic stenosis murmur is, on the other hand, not readily heard in the lung bases, but is heard in the neck and apical region. This phenomenon is better remembered and understood if one recalls that even though considerable lung is interposed between the heart and the posterior chest wall, the root of the left ventricle and the left atrium, over which the murmur is of greatest intensity, lies posteriorly. The point at which we anteriorly approach the heart with our stethoscope is situated proximally to the point of origin of the murmur.

As stated before, causes other than valve deformity must not be considered benign conditions. They often have a graver prognosis than that of valvular damage. Some of these conditions include:

(1) Anemia: Murmurs have disappeared in anemic persons following transfusion, and have appeared following phlebotomies. However, Frielander[7] found no murmur of anemia greater than grade ii plus. He also found that anemia, like fever, was an inconstant cause of a systolic murmur.

(2) Fever: Murmurs are sometimes associated with fever and sometimes subside with the temperature.[7]

(3) Tachycardia: Tachycardia in itself may cause a systolic murmur in some individuals, but in other persons a murmur may be reduced in the presence of a tachycardia. The pulse rate is probably not the influencing factor.[5]

(4) Exercise: Exercise can create murmurs in most normal persons. Frielander[7] recorded the frequency of "effort" murmurs observed by various investigators. The range varied from 90 per cent by Freeman and Levine to 7.8 per cent by Munford. Hyperthyroidism, hypertension, and excitement must also be ruled out before attaching an actual valvular damage diagnosis to the patient. The velocity of ejection, i.e. the vigor and quickness, is probably the cause of these murmurs.

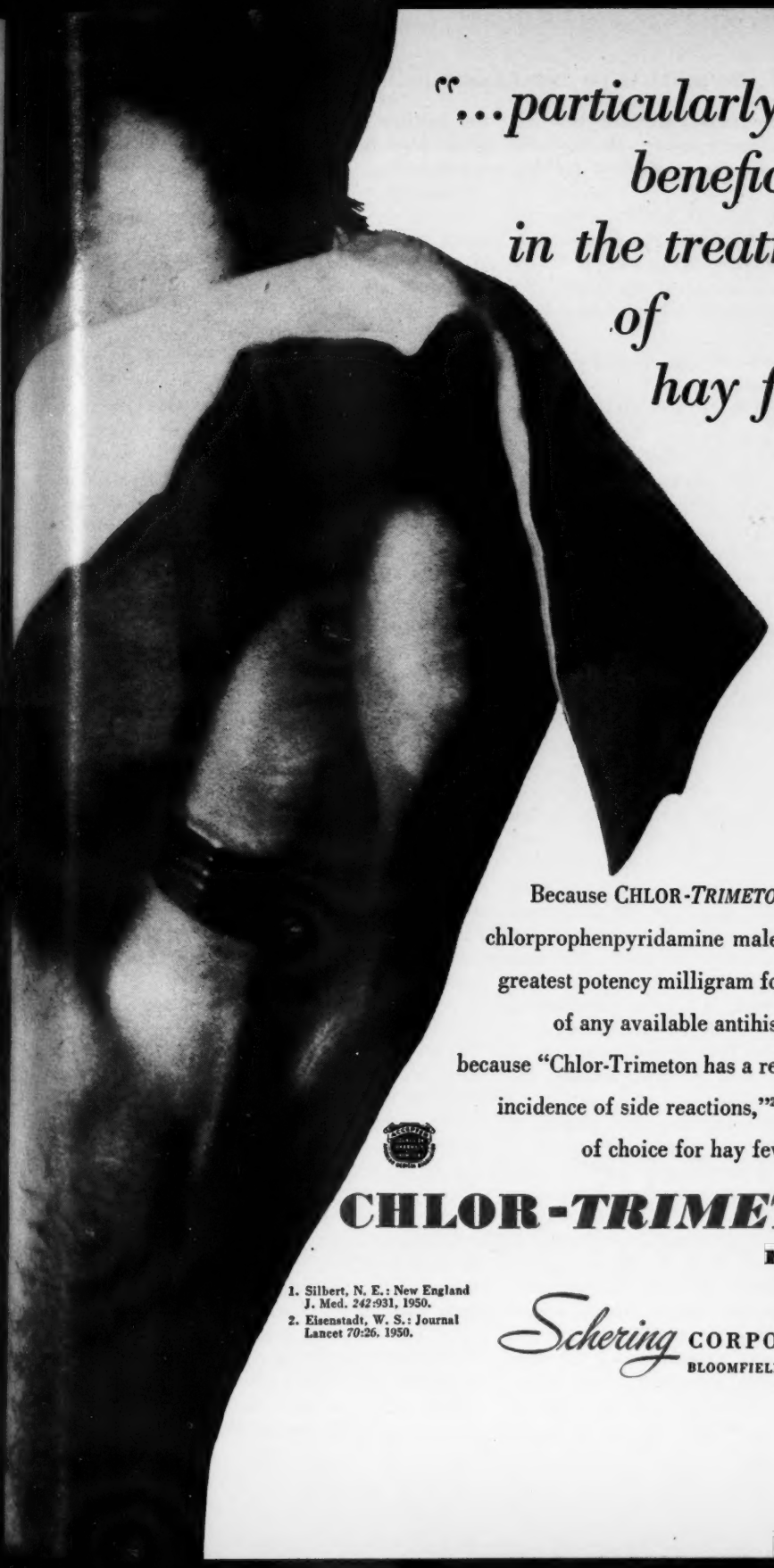
Another cause of apical systolic murmurs is the movement of air in and out of the lung. The heart comprises lung space during diastole, forcing air out of the alveoli. During systole, this space is suddenly reduced and the air, rushing in to fill the rapidly expanding lung, sometimes produces an audible sound, difficult to distinguish from a cardiac murmur.

However, these murmurs can usually be identified by varying respiration. They are always accentuated with inspiration and usually disappear at some stage of respiration, generally with full inspiration.

Friction rubs may cause murmurs that are confused with cardiac murmurs. In many patients, however, murmurs are present and no cause can be incriminated. We can only speculate concerning the etiology of these murmurs. As Sir Thomas Lewis[8] aptly pointed out, a systolic murmur at the apex is an important guide post and should stimulate one to look carefully for other evidence of heart disease.

Most investigators feel that a murmur of less than grade ii intensity is not indicative of valvular disease. However, we have pointed out the significance of non-valvular etiology and must now bear in mind that every loud murmur was of grade i intensity at the beginning. That a given apical systolic murmur may depend upon actual valvular disease is suggested by:

(a) The history of previous conditions commonly associated with heart disease such as endocarditis, rheumatism, chorea, repeated tonsillitis or any alpha-hemolytic streptococcus infection. (Levine[5] will venture a diagnosis of organic mitral insufficiency if there is no other explanation for the murmur, even if there



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1. Silbert, N. E.: New England J. Med. 242:931, 1950.
2. Eisenstadt, W. S.: Journal Lancet 70:26, 1950.

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is no definite rheumatic history, provided there are other stigmata, i.e. a family history of rheumatic fever or rheumatic heart disease, frequent growing pains, etc.).

(b) The coincident signs of mitral stenosis, i.e. diastolic or presystolic murmur, snapping second pulmonic sound, and loud first apical sound.

(c) The fact that the murmur is holosystolic of a grade ii plus intensity and of a harsh and rasping character.

That the murmur depends upon dilatation of the mitral ring may be suggested by:

(a) The absence of a history pointing to pre-existing valvular disease.

(b) Its development in the course of progressive hypertrophy and dilatation from hypertension or syphilitic aortic insufficiency.

(c) Its appearance in the course of acute infectious fevers not commonly associated with endocarditis, or in grave anemias with great muscular weakness.

(d) Acute heart failure occurring in the early stages of rheumatic heart disease.

That the murmur is physiological may be suspected in young people under 30 years of age, especially in girls but often in boys, when the patient is examined in the recumbent posture and when the murmur is accompanied by a louder murmur in the pulmonary area. Thayer[2] states, "Under these circumstances systolic apical murmurs are very common. The heart sounds are generally normal in character, but the first sound at the apex is followed by a fairly distinct whiff which may or may not be transmitted into the axilla."

Evans,[9] making simultaneous phonocardiographic and electrocardiographic recordings, did precise timing of the murmur. He reached the conclusion that whenever a gap was detected between the first heart sound and the murmur following it, it was proof of the murmur's "innocence," i.e. being physiological. These murmurs are usually best heard with the patient lying on the left side. The murmur diminishes in intensity (never more than grade ii) and may disappear with erect posture and/or deep inspiration.

Masters[10] feels that an apical systolic murmur of grade iii or above should be accepted as evidence of organic valvular heart disease until cardiac abnormality can be disproved. It is important to recognize mitral valvular disease since 30 to 50 per cent of persons who have had rheumatic fever develop it, and 20 to 25 per cent fall victim to subacute bacterial endocarditis.[10] Repeated examinations should be made, keeping alert for persistent and/or diastolic components. Fineberg and Steuer[11] found the average time for development of mitral stenosis was 4.7 years after the discovery of the systolic murmur. These patients should receive antibiotics during certain manipulations and diseases which injure the mucous membranes and facilitate bacterial invasion. T. Duckett Jones[12] would place these people on prophylactic penicillin continuously.

Fluoroscopy is another tool in the identification of mitral disease. The barium swallow may reveal a posterior displacement of the esophagus by the left atrium. Fluoroscopy may also show right heart enlargement. The EKG may reveal right axis deviation and right ventricular hypertrophy. In some cases the vital capacity may be reduced as much as 20 per cent.

Some other conditions to be considered in the differential diagnosis of apical systolic murmurs are:

(a) Neurocirculatory asthenia. Other symptoms will usually distinguish this condition, but one must be alert. The low diaphragm, which is characteristic of these people, gives the patient a right axis deviation.

(b) Chest deformities and kyphoscoliosis may produce murmurs.

(c) A split first sound may also be confused with a systolic murmur.

AORTIC SYSTOLIC MURMURS

Murmurs in the aortic area to the right of the sternum may be classified as follows:

(1) With aortic stenosis in adults and as a result of rheumatic fever.

(2) In dilated and hypertrophied hearts, especially in aortic insufficiency, where, with a rim of relatively normal size, a larger and stronger ventricle is forcing blood into an aorta which is capable of wide dilatation.

(3) (The most frequent clinical cause) Dilatation of the ascending aorta above the valve ring. The four main underlying causes are chronic hypertension, aortic regurgitation, arteriosclerosis, and syphilitic aortitis.

(4) Without obvious cardiac abnormalities, as in anemia, diminished viscosity of the blood, and, not infrequently in young neurotic individuals with throbbing vessels. Loud murmurs are heard in the pulmonic area in this condition.

In summary, where the ventricle is dilated or hypertrophied, wherever the aorta beyond the ring is relaxed or dilated, or wherever the ring itself is narrowed, one may and often does hear a systolic murmur at the aortic orifice.

Obesity will also cause an aortic murmur, possibly by elevation of the diaphragm with distortion of the normal aortic contour. Congenital stenosis of the passage of the left ventricle causes a murmur often better heard over the third intercostal space or over the sternum. Sacular aneurysms of the aorta are occasional causes of systolic aortic murmurs.

The murmur of aortic stenosis is harsh, while the murmurs of other causes are usually of a blowing

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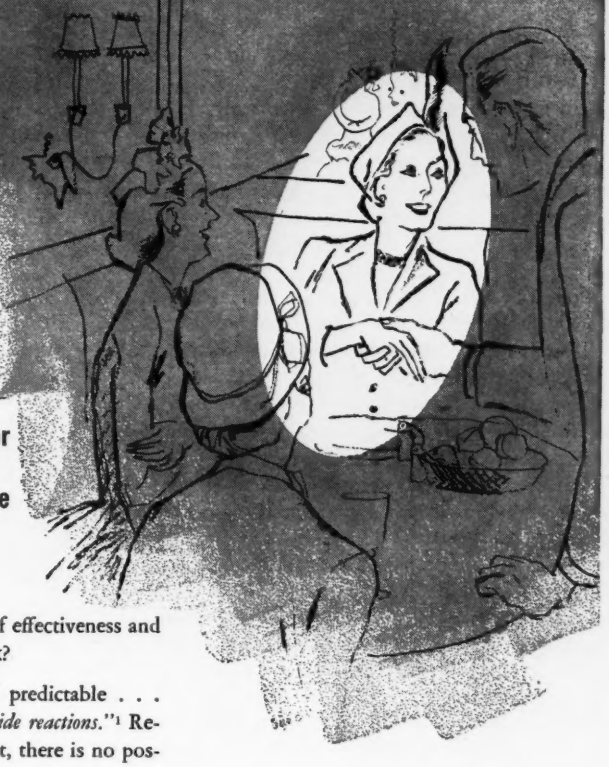

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1. Reich, W. J. et al. (1952), A Recent Advance in Estrogenic Therapy. II. Amer. J. Obst. & Gynec., 64:174, July.

1-1648

nature. These murmurs are often transmitted into the neck, arms, and, as stated before, to the apex. A thrill is often present with this murmur. A stenosed valve frequently has no second sound.

Richard Cabot[13] states, "No diagnosis is satisfactory which rests on the evidence of murmurs alone." Wood and White[13] at Massachusetts General Hospital demanded the following criteria for a diagnosis of aortic stenosis:

(1) Palpable thrill at the base of the heart.
(2) Small plateau pulse.
(3) Absence or diminution of aortic second sound.
(4) Rough systolic murmur over the aortic area.

Using these criteria, no case diagnosed aortic stenosis between the years 1913 and 1923 failed to reveal the lesion at necropsy. Counihan's[14] recent investigations revealed that the sensitivity of the fingers to vibrations in the range of cardiac murmurs is so far inferior to that of the ear that the elicitation of a cardiac thrill becomes a matter of academic curiosity and yields no information of diagnostic import that is not obtained by auscultation. He feels no reluctance in diagnosing aortic stenosis without the classic thrill.

The Boston Board,[15] in examining men for the army, considered any localized systolic murmur of the aortic area of any intensity, unless extremely slight (grade i-) and dispelled by respiration, as grounds for rejection. The New York Board,[15] however, felt otherwise. Systolic murmurs at the aortic area, if not associated with any other abnormal findings, provided they were localized and not harsh, were not regarded as a cause for rejection. The presence of a thrill and diminished intensity of the second sound, of course, emphasized the importance of such murmurs. Fluoroscopic examination to determine the presence or absence of calcification is often helpful in localizing the source of the murmur.

PULMONIC SYSTOLIC MURMURS

The pulmonic area is the most common location for systolic murmurs. Nearly everyone has an audible murmur in this area if he lies down and exhales. If, however, the murmur is of grade ii plus intensity, pathology is very probable.

The cause of the physiological murmur is not known. White[6] speculates that it is probably associated with dilatation of the pulmonary artery under increased pulmonary pressure as in full expiration, with kinking of the artery by change of position, or by other factors leading to dilatation.

Sodeman[16] reports pulmonic systolic murmurs in 60 per cent of children under 14 years of age. It is doubtful that the systolic murmur so often found following exercise is ever more than a grade ii intensity in normal individuals. Frielander[7] does not consider them significant.

Contratto,[17] examining 2,856 college students, found systolic murmurs in 350, or 12.3 per cent. Of these, 208 were physiological, and 127 had murmurs intense enough to watch. These students were allowed unrestricted activity and, during the follow up study, in no case was a diagnosis of valvular heart disease subsequently made. The other 15 patients had pathology.

The Boston Board[15] did not consider systolic murmurs of grade i-ii in the pulmonic area as a cause for rejection, if there was no evidence of heart disease. These murmurs almost always disappeared with full inspiration. A persistent systolic murmur of grade iii or more in the pulmonic valve area was considered cause for rejection.

The physiological murmur is of a blowing character, begins early in systole, and extends through most of it. The murmur is seldom transmitted. The second pulmonic sound is often exaggerated.

Pathological dilatation of the pulmonary artery must always be ruled out. The vessel may be dilated due to pulmonary hypertension secondary to mitral stenosis, left ventricular failure, chronic pulmonary fibrosis, emphysema, or pulmonary endarteritis.

Thyrotoxicosis and congenital defects must also be considered. Congenital pulmonary stenosis demonstrates a harsh systolic murmur, a thrill, and often a marked first sound. This murmur is not generally transmitted, but may often be heard in the lung bases posteriorly.

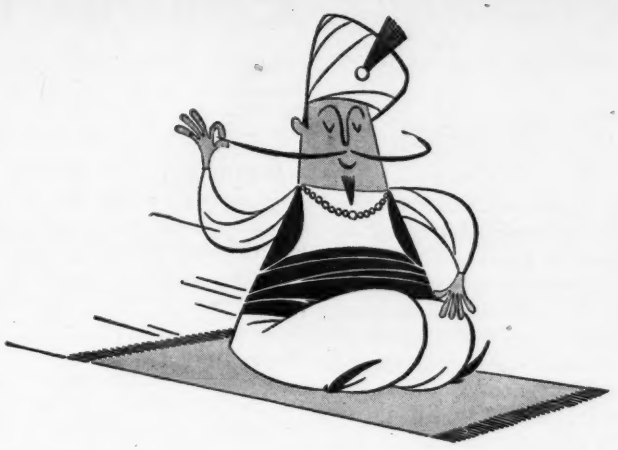
Patent ductus arteriosus causes a systolic murmur, almost always associated with a diastolic murmur, causing the characteristic "machinery murmur." This is usually better heard to the left of the pulmonic area. Coarctation of the aorta and aortic aneurysms may be located in a position favorable for a systolic murmur in the pulmonic area. Transmission of the murmur is the best auscultatory means of differentiating an aortic from a pulmonic stenosis, that of aortic stenosis being widely and loudly transmitted except to the lung bases where it is heard only faintly, and that of pulmonic stenosis being transmitted not far except to the lung bases.

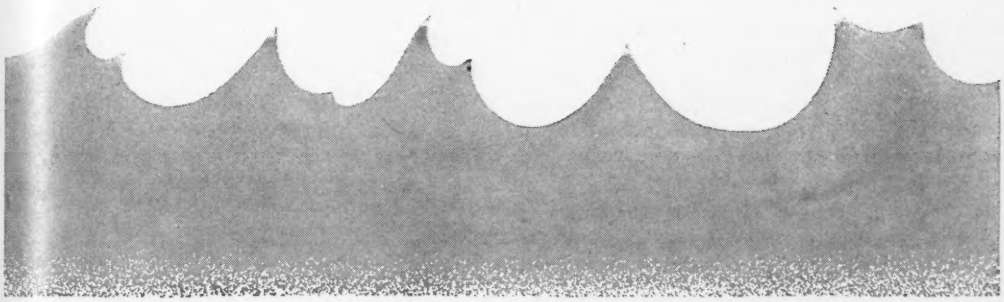
Two other areas often associated with systolic murmurs must be mentioned. The typical Roger's murmur of interventricular septal defect is best heard to the left of the sternum in the third or fourth intercostal spaces. This is usually accompanied by a thrill and is of a loud blowing character.

When a murmur is heard at the base of the sternum, tricuspid insufficiency must be considered. However, a murmur in this area is usually transmitted from somewhere else.

SOME STATISTICS CONCERNING SYSTOLIC MURMURS

Thayer[2] checked apical systolic murmurs in other-





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wise normal individuals in the recumbent position and recorded them by decades.

Decade	1*	2	3	4
Cases	39	98	55	26
Murmurs present	22	35	12	5
Per Cent	56.4	35.7	21.2	19.2

* None under three years.

Stewart,[18] examining 512 Bristol University Students found: 34 per cent had systolic murmurs, 44 per cent of the women and 30 per cent of the men; 21 or 2½ per cent of the total were of grade ii plus. None were higher. One year later his follow-up revealed 61 new murmurs appearing, while 38 old murmurs disappeared. He felt that three cases which had a combination of apical localization and persistence were practical indications of early mitral disease.

Rednick[19] studied the necropsy material of 268 cases with systolic murmurs. He found valvular incompetency in 44 or 16.4 per cent which was attributed to (1) rheumatic fever, (2) arteriosclerosis, (3) syphilis, and (4) congenital malformations. All of these patients had other signs of cardiac involvement. He attributed 136 cases, or 50.7 per cent, to valvular deformities, i.e. sclerosis, vegetations, or nodules. Thayer[2] and others would question that these would cause the murmur. He associated 18.1 per cent with fever, tachycardia, anemia, or hypertension. In 10 cases, or 3.7 per cent, no clinical or pathological explanation for the murmur was found.

Sodeman[16] reported some interesting prognostic material from insurance studies. They report that a decrease in life expectancy has been found with apical systolic murmurs.

Condition	*Mortality rate*
Inconstant systolic apical murmur not transmitted	135%
Constant murmur	156%
Pulmonic systolic murmur	112%
Constant systolic apical murmur transmitted to the left without a history of rheumatic fever	224%
Constant systolic apical murmur transmitted to the left plus cardiac hypertrophy without a history of rheumatic fever	476%

Hunter[10] learned that the mortality rate was 50 per cent higher among manual workers with apical systolic murmur than among "white collar workers."

Baker, Sprague, and White[20] did 10- and 15-year follow-ups on grade iv, v, and vi systolic murmurs without diastolic murmurs. Eighteen per cent of these were aortic. Of 187, 155 had died at the end of 10 years, 47.7 per cent within one year. One hundred thirty-one (92.2 per cent) had died of cardiovascular disease; seven of subacute bacterial endocarditis (24 per cent of the deaths among those with rheumatic heart disease); nine of venereal disease, not in the heart; one of uremia, and eight of cerebral vascular accidents.

Per cent of those dead, time of follow-up, and etiological agent:

Etiology	*Dead at 10 years*	*Dead at 15 years*
Degenerative	73.5%	98.3%
Rheumatic	40%	75.7%
Uncertain etiology	50%	80%

Shapiro,[21] in 1939, felt that pathology could be ruled out with 98 per cent accuracy by x-ray, intensity, location, and with a careful history. He demanded the following criteria for a physiological diagnosis: (1) not transmitted, (2) short, (3) no obscurity of the first sound.

CONCLUSIONS

Any systolic murmur must be considered as possible evidence of pathology. A thorough investigation is mandatory for every patient presenting such a murmur. With the present tools and information available, a physician can be accurate in identifying pathological lesions. Every case must be managed and followed according to its own merits. Aortic systolic murmurs are much more significant than apical or pulmonic. Extreme care must be taken not to terrify the patient with the belief that he or she has heart trouble when the murmur is physiological.

SUMMARY

1. The problem of the systolic murmur is discussed.

2. The mechanism of a murmur is considered.

3. The terminology for systolic murmurs is expressed.

4. Murmurs are discussed by their location with regard to pathology, etiological possibilities, and associated diagnostic aids.

5. Authorities and statistics on the frequency and the prognosis of patients with systolic murmurs are quoted.

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A five-year scholarship which carries an honorarium of $30,000 was awarded recently by the John and Mary R. Markle Foundation of New York to Dr. Charles F. Kittle, instructor in surgery at the University of Kansas School of Medicine. Dr. Kittle, with other members of the cardiovascular laboratory, is studying the surgical repair of faulty valves of the heart. He is the first member of the Kansas faculty to receive a Markle award and is one of 21 physicians so honored this year.

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Dr. Kittle is a graduate of the University of Chicago. He began postgraduate study at Kansas University in 1948 and received a master of science degree in surgery in 1950, after which he began teaching.

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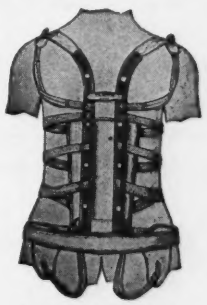

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